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Developmental Neuroscience, Children's Relationships with Primary Caregivers, and Child Protection Policy Reform

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Empirical research has confirmed that the harms of child maltreatment can affect almost every area of an individual's functioning and can reverberate across relationships, generations, and communities. Most recently, investigators at the U.S. Centers for Disease Control have called for policymakers to prioritize prevention and amelioration of child maltreatment in a manner consistent with its approach to other major public health problems.

This Article—an outgrowth of a panel on Relationships with Caregivers and Children's Neurobiological Development, which took place at a recent symposium, Law and Policy of the Developing Brain, co-sponsored by the University of California's Hastings College of the Law and Stanford Law School—addresses some of the potential policy applications of research on the neurobiology of attachment, maltreatment, and trauma, with particular attention to the government's articulated mission of safeguarding children's welfare.

Part I of this Article address the state's relationship with children and families, and the law's recognition of the centrality of children's primary caregivers—typically their parents—to children's well-being. Part II critiques certain aspects of our legal system's predominant response to child maltreatment. Part III reviews recent research on the effects of child maltreatment, with special attention to developmental neurobiological findings. Part IV addresses some implications of these findings for child protection policy and sets forth recommendations that are consistent with the empirical research and responsive to the critiques set forth in Part II.

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TABLE OF CONTENTS

INTRODUCTION 1488
I. STATE INTEREST IN THE FAMILY AND RELIANCE ON PARENTAL AUTHORITY 1492
II. STATE INTERVENTION IN THE FAMILY IN RESPONSE TO CHILD MALTREATMENT 1498
III. THE EFFECTS OF CHILD MALTREATMENT 1508
A. "TOXIC STRESS" AND "ALLOSTATIC LOAD" 1513
B. THE INTERACTION OF TOXIC STRESSORS AND DEVELOPMENTAL PROCESSES 1517
C. SOME FINDINGS ON THE NEUROBIOLOGY OF CHILD MALTREATMENT AND OF EARLY LIFE TRAUMATIC EXPERIENCES 1520
D. THE PARTICULARIZED IMPACT OF MALTREATMENT BY ONE'S PRIMARY CAREGIVER 1528
IV. SOME IMPLICATIONS OF DEVELOPMENTAL NEUROSCIENTIFIC FINDINGS FOR CHILD PROTECTION POLICY 1537
A. INCREASING GOVERNMENTAL FINANCIAL COMMITMENT TO THE PROBLEM AND CONSEQUENCES OF CHILD MALTREATMENT 1541
B. PRIORITIZING PREVENTION 1542
C. APPLYING AN ECOLOGICAL-BIODEVELOPMENTAL FRAMEWORK THAT PROMOTES INTERSYSTEM COORDINATION 1547
D. ENSURING THAT ALTERNATIVE PLACEMENTS MEET MALTREATED CHILDREN'S SPECIAL NEEDS 1549
CONCLUSION: "THE NEUROBIOLOGY OF HOPE" 1551

INTRODUCTION

Child maltreatment exacts a heavy toll on many within our society. Its impact extends beyond its most direct victims, reverberating across relationships, generations, and communities. In the last several decades, empirical research has confirmed that the harms to direct victims of child maltreatment are not limited to the scars of physical abuse. Child maltreatment can affect almost every area of an individual's functioning, with consequences manifesting throughout one's lifetime. It can lead to an increased risk of serious health conditions, even influencing the likelihood of premature death in adulthood. Some—but of course not all—of these effects can be measured economically. A recent study performed under the auspices of the U.S. Centers for Disease Control ("CDC") concluded that the financial cost of child maltreatment rivals that of conditions such

as stroke and type 2 diabetes.[1] The investigators concluded that the "costs and prevalence [of child maltreatment] are high enough for policy makers to justify allocating resources to effective prevention and mitigation strategies."[2]

Our society's—and therefore our legal system's—interest in the parent-child relationship is, of course, not new. Historian Michael Grossberg tells us that during the nineteenth century, Americans' awareness of the importance of a child's caregiving environment for that child's development and future became more prominent:

> During the nineteenth century, children came to be seen more explicitly than ever as vulnerable, malleable charges with a special innocence and with particular needs, talents, and characters.... Though other institutions such as the common school and the church shared its duties, molding the nation's young... became more clearly the primary responsibility of the family.... [Y]outhful minds and bodies would develop properly only in a special, sheltered home under the watchful guidance of concerned... parents.... [T]he parent-child relation... became an all-important nexus.[3]

These views were cited to justify expanding intervention in families. The state pursued strategies to supplement and guide the socialization opportunities of all children by, for example, compelling school attendance and restricting child labor. Intervention also targeted families seen as failing to provide their children with an adequate upbringing. Precursors of today's child protection system removed children from their homes in an attempt to compensate for perceived parental limitations.[4] Many children

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1. Xiangming Fang et al., *The Economic Burden of Child Maltreatment in the United States and Implications for Prevention*, 36 CHILD ABUSE & NEGLECT 156, 162 (2012). The investigators estimated the economic costs of child maltreatment, applying some of the newer findings about the lifetime effects of child maltreatment on long- and short-term health and mental health costs, child welfare costs, human capital productivity losses, criminal justice costs, and special education costs. *Id.* Although the authors used fairly sophisticated methods, they acknowledged some obvious limitations of their work, such as relying on identified cases of child maltreatment, which are recognized as an underestimate. *Id.* In addition, the methods did not examine many of the costs that follow from the ripple effects of child maltreatment. *Id.* Despite these and other limitations, the conservative estimates of the cost of each new case of nonfatal child maltreatment are comparable to public health problems such as stroke and type two diabetes. *Id.*

2. *Id.*

3. MICHAEL GROSSBERG, GOVERNING THE HEARTH: LAW AND THE FAMILY IN NINETEENTH-CENTURY AMERICA 8–9 (1985).

4. Lois A. Weithorn, *Envisioning Second-Order Change in America's Responses to Troubled and Troublesome Youth*, 33 HOFSTRA L. REV. 1305, 1388–89 (2005) [hereinafter Weithorn, *Envisioning Change*]. The development of institutions serving children was part of larger "systemic attempts to purify the environments of the young, to withdraw them from debasing community temptations, and to immerse them in networks of good influence." Barbara Finkelstein, *Casting Networks of Good Influence: The Reconstruction of Childhood in the United States, 1790–1870*, *in* AMERICAN CHILDHOOD: A RESEARCH GUIDE AND HISTORICAL HANDBOOK 111, 117 (Joseph M. Hawes et al. eds., 1985). The institutionalization movement focused on youth with deceased, absent, ill, or impoverished parents as well as those whose parents had allegedly failed in adequately socializing their children. Orphanages and houses of refuge became increasingly common ways of dealing with these children. Although the

of immigrants, the poor, and other disfavored groups within society, along with some children who might be viewed as maltreated by today's standards, were separated from their families with the goal of protecting these children's welfare and reducing their chances of becoming "pests to society" or future "tenants of . . . prisons."[5] Clearly, social biases—together with all sorts of assumptions about what is harmful to and healthy for children—guided policy.

Today, social biases and assumptions about what is harmful to and beneficial for children still have an impact on when and how the state intervenes.[6] Time, however, has brought with it many changes as well. In the last several decades, more narrow legal standards—constrained by constitutional protection of the parent-child relationship and by a panoply of procedural requirements—have limited the reach of the state into family affairs.[7] Furthermore, we now have access to a greater body of empirical knowledge about how to promote safe and healthy childhoods and how to enhance the potential for positive developmental trajectories into adulthood. There is much we do not know, but our knowledge about children's development and the impact of various influences on developmental processes continues to grow. This knowledge base can begin to inform legal policy decisions, replacing untested assumptions about human behavior, functioning, and relationships as well as educating us about the efficacy and unintended consequences of the law's interventions.

Understanding how children's relationships with their primary caregivers affect the course of their development has long been a major focus of theory and research in psychology, medicine, and specialties in the biological sciences. In the past several decades, the evolution of methodologies, models, and research in the neurosciences has focused attention on the impact of these relationships on brain development and functioning throughout life.[8] The University of California, Hastings College of the Law recently co-sponsored a conference entitled *Law and Policy of the Developing Brain: Neuroscience from Womb to Death* with

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name orphanage implies that these facilities served children whose parents were deceased, admission policies were flexible, casting a relatively wide net that extended beyond parentless children. From the perspective of these facilities' administrators, "there was no reason to penalize the unfortunate child for the fact of his parents' survival." DAVID J. ROTHMAN, THE DISCOVERY OF THE ASYLUM 207 (3d ed. 2002).

5. *Id.* at 210.

6. *See infra* notes 70–75 and accompanying text.

7. *See, e.g.*, Santosky v. Kramer, 455 U.S. 745, 747–48 (1982) (determining that the Fourteenth Amendment requires clear and convincing evidence prior to termination of parental rights); Roe v. Conn, 417 F. Supp. 769, 779–80 (D.C. Ala. 1976) (holding unconstitutionally vague an Alabama statute defining a "neglected child" as a child "whose home . . . is an *unfit* or *improper* place for such child" without more specificity as to what conditions or circumstances render a home to be "unfit" or "improper" (emphasis added)).

8. *See infra* Part III.

Stanford Law School. The panel on which I participated, *Relationships with Caregivers and Children's Neurobiological Development*, explored some of the cutting-edge neuroscientific findings on the impact of attachment, maltreatment, and trauma on children's developing brains.[9] In this Article, I share some initial thoughts on the possibilities of the application of this and related research for legal policies geared toward executing the government's articulated mission of safeguarding children's welfare by protecting them from maltreatment.[10]

Part I of this Article sets forth the nature of the state's interests in the family as well as the state's unique concerns for and relationships with children. These interests and concerns provide the foundation for the state's regulation of families and children.

Part II discusses our nation's predominant response to child maltreatment. Out of respect for family privacy and parental autonomy, the state avoids involvement in family affairs until or unless parents are viewed as having failed their children in some extreme manner, thereby creating a serious danger to that child's well-being. The state selectively intervenes in that subset of families, often with removal of children from the home. Prior to such intervention, most modern families are left on their own or offered limited assistance in childrearing. The timing (once conditions in the home have deteriorated sufficiently to catch the state's attention) and manner (coercive interference in parental autonomy) of the state's intervention set up an adversarial contest between the state and the family. Torn between two cherished ideals—respect for parental autonomy and protection of children from harm—the responses of policymakers and other state actors to child maltreatment are plagued by ambivalence, leading to inconsistent and ineffective policies and practices. Part II suggests reframing the state's relationship with families at risk for child maltreatment by focusing on common concerns of the parents and the state in the welfare of children, minimizing coercive intervention in the family and avoiding delays in state assistance to families. This approach is also more consistent with the scientific research reviewed in Part III, which emphasizes the importance of intervening as early as possible to protect children from maltreatment.

Part III reviews some of the recent research on the effects of child maltreatment. Although the focus is on neurobiological effects, it discusses certain other lines of research which help place the

9. In addition to this Author, presenters included Regina Sullivan, Ph.D., Research Professor of Child and Adolescent Psychiatry, New York University School of Medicine, and Developmental Behavioral Neurobiologist, Emotional Brain Institute, Nathan Kline Institute for Psychiatric Research; Victor Carrion, M.D., Associate Professor of Child Psychiatry and Behavioral Science, Director of Stanford Early Life Stress Research Program, Stanford University School of Medicine; and Ross Thompson, Ph.D., Distinguished Professor of Psychology, University of California at Davis.

10. *See infra* Part IV.

neurobiological findings in context. In discussing the neurobiological effects of child maltreatment, I examine, in particular, themes relating to: (1) notions of "toxic stress" and "allostatic load," (2) the interaction of toxic stressors with developmental processes, (3) neuroscientific findings on the effects of child maltreatment or childhood trauma on the brain, and (4) the particularized impact of maltreatment by one's primary caregiver.

Part IV addresses some implications for child protection policy arising from the research reviewed in Part III and in light of the analyses offered in Part II. It recommends: (1) increasing governmental investment in preventing and responding to child maltreatment and its sequelae; (2) targeting the development, testing, and implementation of effective preventive and early intervention programs, including intensive home-based interventions; (3) adopting ecological and biodevelopmental frameworks, as well as coordinating intersystem responses to child maltreatment, in order to respond to the multifaceted nature of affected children's and families' needs; and (4) where children's safety and well-being necessitates removal from the home, providing stable, high-quality placements in which alternative caregivers, whether kin or non-family, receive training and supportive services to provide children with enhanced opportunities to cope with separation and benefit from sensitive and responsive care.

Finally, the conclusion borrows a phrase used by neurobiologists Michael De Bellis and Lisa Thomas, "the neurobiology of hope," in order to convey the optimism spawned by empirical research revealing previously unknown potentials for the human brain to recover from insults when presented with opportunities for recovery and positive growth.[11]

I. STATE INTEREST IN THE FAMILY AND RELIANCE ON PARENTAL AUTHORITY

Families "are the building blocks out of which the larger units of social organization are fashioned."[12] The law is concerned with the family, its structure, its functioning, and its welfare because we view the well-being of society at-large as linked to that of the family:

> From ancient times, it has been widely recognized that there exists an essential connection between families and the larger societies that contain them. It is not only that families are the schools of first instance, in which children learn to embrace their deepest and most primitive assumptions about life and other people. . . . [T]he family is a

11. De Bellis & Thomas, *infra* note 165, at 114

12. John Demos, *Images of the American Family, Then and Now*, *in* CHANGING IMAGES OF FAMILY 43, 46 (Virginia Tufte & Barbara Myerhoff eds., 1979).

> sort of molecule, the very stuff of which the larger society is composed, so that the welfare of the one and the other are indissolubly coherent.[13]

While values of care and support characterize social and legal expectations surrounding a variety of family relationships, such as those between spouses and spouse-equivalents and those between adult children and their aging dependent parents, in the United States there is arguably no set of family obligations more universally embraced, or more deeply embedded in our family law, than the duties of parents to care for their minor children. Indeed, the family is also the institution within which we reproduce ourselves—biologically, socially, culturally, and politically.[14] Arguably, one of the most critical roles the family plays in this regard is the procreation and upbringing of children. It serves as the primary source of care, nurturance, support, socialization, and inculcation of cultural and other values and, in so doing, promotes the goals it shares with the wider society.

Our legal system explicitly recognizes the role of the parent as a stable feature of family life in American culture.[15] Parents are invested with the responsibility to care for, support, and raise their children, and this is coupled with a substantial measure of autonomy in carrying out those responsibilities. Decades of Supreme Court jurisprudence extol this central tenet of American law's relationship with the family: "The history and culture of Western civilization reflect a strong tradition of parental concern for the nurturing and upbringing of their children. This primary role of parents in the upbringing of their children is now established beyond debate as an enduring American tradition."[16]

Throughout the twentieth century, this "tradition" was constitutionalized.[17] As the Court articulated in 2000 in *Troxel v. Granville*: "[I]t cannot now be doubted that the Due Process Clause of the Fourteenth Amendment protects the fundamental right of parents to make decisions concerning the care, custody, and control of their children."[18] This doctrine of parental autonomy insulates parents from state intervention in childrearing in many contexts, investing parents with significant independence in childrearing.

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13. David D. Haddock & Daniel D. Polsby, *Family as a Rational Classification*, 74 WASH. U. L.Q. 15, 17–18 (1996) (footnotes omitted).

14. Philosopher John Rawls emphasized that one of the family's principal functions is to promote "the orderly production and reproduction of society and its culture from one generation to the next." John Rawls, *The Idea of Public Reason Revisited*, 64 U. CHI. L. REV. 765, 788 (1997).

15. Wisconsin v. Yoder, 406 U.S. 205, 232 (1972).

16. *Id.*

17. *See, e.g.*, Troxel v. Granville, 530 U.S. 57, 65–67 (2000); Santosky v. Kramer, 455 U.S. 745, 753 (1982); Parham v. J.R., 442 U.S. 584, 602 (1979); *Yoder*, 406 U.S. at 233; Stanley v. Illinois, 405 U.S. 645, 651 (1972); Prince v. Massachusetts, 321 U.S. 158, 166 (1944); Pierce v. Soc'y of Sisters, 268 U.S. 510, 514–16 (1925); Meyer v. Nebraska, 262 U.S. 390, 400 (1923).

18. 530 U.S. at 66.

Yet, the law governing state regulation of children and families is unique because of the state's distinctive relationship to children.[19] Although American law clearly protects parental authority in most aspects of childrearing in creating a "private realm of family life which the state cannot enter," parental discretion is not absolute.[20] The state's parens patriae and police power interests in children's and the public's welfare guide determinations as to the proper allocation of legal authority between parents and the state.[21]

The state's parens patriae power refers to its authority to regulate certain aspects of the lives of some of its citizens for the purpose of protecting those individuals' welfare.[22] The state's police power interest, in contrast, justifies regulations that seek to "secure generally the comfort, safety, morals, health, and prosperity" of the society as a whole,[23] thus permitting the regulation of children and families where doing so is deemed necessary to promote the general welfare. As noted above, the law's regulation of the family is guided, in part, by the view that society's well-being depends on the healthy functioning of the family. The upbringing and socialization of children have consequences not only for the children's own lives, but for the future of society as a whole. In the words of the Supreme Court:

> A democratic society rests, for its continuance, upon the healthy, well-rounded growth of young people into full maturity as citizens, with all that implies. It may secure this against impeding restraints and dangers within a broad range of selection. Among evils most appropriate for such action are the crippling effects of child employment....

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19. Natalie Loder Clark, *Parens Patriae and a Modest Proposal for the Twenty-First Century: Legal Philosophy and a New Look at Children's Welfare*, 6 MICH. J. GENDER & L. 381, 392 (2000) ("[C]hildren may be special objects of governmental coercion, not because they need the state but because they are needed by the state [as future citizens].").

20. *Prince*, 321 U.S. at 166.

21. *See generally*, IRA MARK ELLMAN ET AL., FAMILY LAW: CASES, TEXT, PROBLEMS 1127–1306 (5th ed. 2010).

22. For a discussion of the origins of, and for judicial and scholarly commentary regarding, the concept of parens patriae power, see Weithorn, *Envisioning Change*, *supra* note 4, at 1402–03 nn.410–12. *See generally* Clark, *supra* note 19; Gregory Thomas, *Limitations on Parens patriae: The State and the Parent/Child Relationship*, 16 J. CONTEMP. LEGAL ISSUES 51 (2007). Most typically, the state exercises this authority much like a guardian or benevolent parent, acting to safeguard the welfare of those whose incapacity or youth renders them more vulnerable or less able to protect their own interests than ordinary citizens. The parens patriae power is, at times, invoked even where there is no incapacity or youth. Thus, the "state's authority over children's activities is broader than over like actions of adults." *Prince*, 321 U.S. at 168. Because parents typically control their children's upbringing, state regulation of children's welfare under the parens patriae authority typically implies some limitation on the authority of parents. "Acting to guard the general interest in youth's well being, the state as *parens patriae* may restrict the parent's control by requiring school attendance, regulating or prohibiting the child's labor and in many other ways.... [T]he state has a wide range of power for limiting parental freedom and authority in things affecting the child's welfare." *Id.* at 166–67 (footnote omitted).

23. BLACK'S LAW DICTIONARY 1041 (5th ed. 1979).

> [L]egislation appropriately designed to reach such evils is within the state's police power . . . .[24]

While the parens patriae and police power justifications for regulating children's lives are theoretically quite distinct, many regulations of children's and families' lives are justified by both sets of interests. To the extent that an intervention authorized by the police power seeks to further the common good by promoting the child's healthy development, that intervention may also serve parens patriae interests. Such positive development is likely to be as salutary to children's own best interests as to those of their community. Arguably, the convergence of these two sets of justifications in particular contexts has allowed the state to forge some of its most expansive interventions in the lives of children and families, such as universal compulsory education, child labor restrictions, and the development of state-based child welfare and juvenile justice systems.[25]

Our legal system begins with certain assumptions that support constitutional protection of the parent-child relationship. We presume that parents generally "act in the best interests of their children,"[26] guided by "natural bonds of affection."[27] These assertions about parent-child relationships appear grounded in a general recognition of powerful emotions underlying most parents' inclinations to promote their children's welfare, including the inherent selflessness that parents often exhibit.[28] Indeed, one need not open a psychology textbook to observe the depth and breadth of most parents' love for their children and the sincere devotion of most parents in promoting what they perceive to be their children's welfare. And, given the indeterminacy of what constitutes any particular child's "best interests,"[29] it seems sensible to start by presuming that most parents do foster their children's welfare. The same "pages of human experience" that lead us to this default position also instruct us that these "natural bonds of affection" characterize children's

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24. *Prince*, 321 U.S. at 168–69 (citations and footnotes omitted).

25. For further discussion of the development of these particular child service and intervention systems, see generally Weithorn, *Envisioning Change*, *supra* note 4.

26. Parham v. J.R., 442 U.S. 584, 602 (1979). This is one of three presumptions identified by the Court as the basis for Constitutional protection of parental autonomy in childrearing. In addition, the law presumes that minors' immaturity, inexperience, and under-developed capacity for judgment limit their ability to direct their own lives, and that parents "possess what a child lacks" in these areas of functioning. *Id.*

27. *Id.*

28. *See* Barbara Bennett Woodhouse, *Of Babies, Bonding, and Burning Buildings: Discerning Parenthood in Irrational Action*, 81 VA. L. REV. 2493, 2494–97 (1995) (noting that intense emotions experienced by parents with respect to their children often lead parents to engage in actions that might be viewed as irrational if observed in other relationships, such as the willingness of parents to risk their own lives to protect their children from dangers).

29. Robert H. Mnookin, *Child-Custody Adjudication: Judicial Functions in the Face of Indeterminacy*, 39 LAW & CONTEMP. PROBS. 226, 289 (1975).

relationships with their parents as well.[30] Once children and parents have commenced a relationship, parents are not interchangeable with other caregivers in the child's emotional experience.[31]

American law's entrustment to parents of most facets of children's upbringing and preparation for adult life creates legally enforceable duties. A network of federal and state laws set forth many parental obligations and, in some cases, legal monitoring and enforcement mechanisms.[32] State protection of parental autonomy has been viewed as a sort of quid pro quo—a reciprocal component that goes hand-in-hand with the weighty responsibilities of parenthood.[33] This has been referred to as the "exchange" theory of parenthood: Parental duties create parental rights, and vice versa.[34] Constitutional protection of parental discretion in childrearing has also been viewed as a tool to promote parental efficacy and commitment in the fulfillment of those responsibilities.[35] Elizabeth and Robert Scott argue that legal protection for parental discretion serves to promote parental commitment to their children's interests by serving as "an important inducement to encourage investment" by parents in their children's welfare.[36] We presume not only that parents will generally be capable and motivated to act in their children's best

30. *Parham*, 442 U.S. at 602.

31. Empirical research relevant to these assumptions is addressed below, in Part III.D. *See infra* notes 215–226 and accompanying text.

32. For example, parents are required to support their children financially, whether or not children are in their legal custody or reside with them. State and federal policies provide for the calculation and enforcement of support obligations. *See, e.g.*, Laura W. Morgan, *Child Support Fifty Years Later*, 42 FAM. L.Q. 365 (2008). In addition, the child protection system consists of a network of civil and criminal statutes that set forth minimal standards of care and protection expected of all parents. These statutes detail obligations relating to children's basic needs (such as provision of adequate food, clothing, shelter, and medical care) and protection of the child from harm. *See, e.g.*, CAL. WELF. & INST. CODE § 300 (West 2011); *see also* Lois A. Weithorn, *Protecting Children from Exposure to Domestic Violence: The Use and Abuse of Child Maltreatment Statutes*, 53 HASTINGS L.J. 1, 51 (2001) [hereinafter Weithorn, *Protecting Children*].

33. Katharine T. Bartlett, *Re-Expressing Parenthood*, 98 YALE L.J. 293, 298 (1988).

34. *Id.*

35. Elizabeth S. Scott & Robert E. Scott, *Parents as Fiduciaries*, 81 VA. L. REV. 2401, 2421 (1995).

36. *Id.* at 2440. Elizabeth and Robert Scott assert that, like the responsibilities of fiduciaries, the duties of parents are complex and not easily reducible to specific obligations, demand considerable decisionmaking discretion, and are difficult to monitor. *Id.* at 2419–20. The broad discretion granted to fiduciaries in carrying out their duties—subject primarily to general obligations of care and loyalty—not only allows fiduciaries to fulfill their duties more efficiently than would an arrangement that micro-managed their day-to-day functions, but also serves as a "reward" of sorts for their commitment to the interests of their beneficiaries. *Id.* at 2429. They note that parent-child relationships begin with a powerful emotional attachment. This predisposes the parents to make their children's interests paramount, and in an intact family these predispositions—together with "internalized informal norms about parenting—are assumed to function effectively, mitigating potential conflicts of interest." *Id.* at 2446. By contrast, the Scotts argue further that, once the family is "fractured," either through "voluntary" actions such as parental separation or divorce, or because the state has found parental conduct inadequate, as in the child protection context, more intrusive legal regulation replaces the more extralegal and internalized informal norms. *Id.*

interests, but that a broad grant of autonomy to parents in childrearing is an essential component of the arrangement. That grant of autonomy helps parents maintain their motivation to place their children's interests first and is also highly practical because the state is unlikely to be able to manage all of the day-to-day decisions and functions required of parents.[37]

To the extent that our society seeks to protect, and perhaps encourage, diversity within its midst, supporting some measure of parental autonomy in childrearing is sensible.[38] Pluralism can more easily survive and even flourish where children's socialization includes not only inculcation of widely shared social values, but also exposure to viewpoints and traditions held by smaller subgroups within society.[39] The Supreme Court stated this premise with clarity in *Pierce v. Society of Sisters*, in which the Court struck down an Oregon statute that restricted parents' free choice among educational institutions for their children:

> The fundamental theory of liberty upon which all governments in this Union repose excludes any general power of the State to standardize its children by forcing them to accept instruction from public teachers only. The child is not the mere creature of the State; those who nurture him and direct his destiny have the right, coupled with the high duty, to recognize and prepare him for additional obligations.[40]

Thus variation among family approaches to childrearing is, in theory, to be protected—indeed, promoted—in the absence of indications that particular approaches are harmful to children, not only because we believe that parental autonomy is an inviolable component of liberty, but also because its protection benefits us all in producing a more robust citizenry and a stronger society.[41]

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37. *See* Emily Buss, *"Parental" Rights*, 88 VA. L. REV. 635, 656 (2002) ("The law places primary responsibility for child rearing with parents—a responsibility that includes the intense day-to-day involvement of nurturance and the long-term investment that instills values and fosters skills, . . . [which serves as a] means of ensuring the effective satisfaction of these important responsibilities."); *Developments in the Law: The Constitution and the Family*, 93 HARV. L. REV. 1156, 1214 (1980) (stating that the state is simply unqualified—in comparison with parents—to provide "the intimacy, stability, and emotional support required for a child's healthy development. . . . [and to] make all of the countless detailed, subjective decisions necessary in rearing children").

38. Martha Minow, *About Women, About Culture: About Them, About Us*, 129 DAEDALUS 125, 139 (2000).

39. Pierce v. Soc'y of Sisters, 268 U.S. 510, 535 (1925).

40. *Id.*

41. One additional view of state protection of parental autonomy deserves mention. Barbara Bennett Woodhouse has argued that vestiges of traditional views of women and children as the property of husbands and fathers continue to influence modern child-family-state jurisprudence: "Themes of individualism, private enterprise, and parental rights of ownership mark our history and survive in our state laws of custody and our constitutional doctrines of family 'autonomy' and 'privacy.'" Barbara Bennett Woodhouse, *Hatching the Egg: A Child-Centered Perspective on Parents' Rights*, 14 CARDOZO L. REV. 1747, 1812 (1993). Professor Woodhouse argues that constitutional precedents protecting family privacy reveal their "dark side" when parental autonomy operates like a form of ownership favoring those who have a possessory claim of parenthood but have failed to meet

In summary, this Part establishes the default assumptions and policies that guide the state's relationships with families in the shared enterprise of raising and socializing children. Parents are presumed to have the capacity and motivation to act in their children's best interests, with strong bonds of affection and adequate measures of wisdom and good judgment guiding their decisions and actions. And yet, as alluded to in the discussion above and elaborated upon below, this is only the starting point. The default position favoring parental autonomy is supplemented by a range of policies, some of which might be viewed as checks on parental discretion and others, perhaps as an augmentation of socializing influences available to children.

II. STATE INTERVENTION IN THE FAMILY IN RESPONSE TO CHILD MALTREATMENT

Law is ubiquitous in the lives of children and their caregivers and regulates many aspects of relationships within the family, and interactions between the family and social or governmental institutions. Parents must comply with their state's compulsory education statutes.[42] Children cannot legally participate in the labor force, except under certain limited circumstances.[43] Unless otherwise exempt, parents must obtain vaccinations for their children prior to public school enrollment.[44] Exceptions to the doctrine of parental consent for minors' health care allow teens to access certain types of treatment, such as contraception, without parental authorization or knowledge.[45] And a highly complex network of child protection laws provides states with the authority to intervene in the family in response to findings of various categories of maltreatment, permits removal of a child from parental custody if such action is deemed necessary for the child's safety and, in the most extreme cases, condones permanent severance of the parent-child relationship.[46]

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the child's needs for care and nurturance. *See generally* Barbara Bennett Woodhouse, *The Dark Side of Family Privacy*, 67 GEO. WASH. L. REV. 1247 (1999).

42. For a discussion of compulsory education policies see, for example, *Wisconsin v. Yoder*, 406 U.S. 205 (1972).

43. Douglas L. Kruse & Douglas Mahony, *Illegal Child Labor in the United States: Prevalence and Characteristics*, 54 INDUS. & LAB. REL. REV. 17, 18–20, 37 (2000) (summarizing current legal restrictions on child labor, their exceptions, and estimates of violations); *see also* STEPHEN B. WOOD, CONSTITUTIONAL POLITICS IN THE PROGRESSIVE ERA: CHILD LABOR AND THE LAW 3 (1968); Weithorn *Protecting Children*, *supra* note 32, at 51 (summarizing the contentious legal developments in the United States culminating in federal child labor restrictions).

44. *See generally* Ross D. Silverman, *No More Kidding Around: Restructuring Non-Medical Childhood Immunization Exemptions to Ensure Public Health Protection*, 12 ANNALS HEALTH L. 277 (2003) (discussing current laws governing compulsory vaccinations, including the myriad exemptions for those who object, and recommending policy reforms).

45. *See, e.g.*, IRA MARK ELLMAN ET AL., FAMILY LAW: CASES, TEXT, PROBLEMS 1171–1204 (5th ed. 2010).

46. Weithorn, *Protecting Children*, *supra* note 32, at 61–70.

For most families, however, the law's influence is not perceived as intrusive—even though many of the most significant regulatory policies were either nonexistent or highly contested as recently as a century ago.[47] In particular, the law governing responses to child maltreatment is of very recent origin.[48] Public concern about and coordinated social responses to the plights of maltreated children reflect relatively "modern" perspectives about children, families, and family-state relationships. Settlers, colonists, and early Americans did not recognize child maltreatment as a problem requiring public attention.[49] Mechanisms, typically informal, existed to deal with orphaned, abandoned, and other dependent children.[50] Corporal punishment was the routine practice for promoting children's obedience and moral development, and the prerogatives of parents, guardians, and other adults to use discretion in the discipline and training of children within their charge were rarely questioned.[51]

Slowly, attitudes changed, as did a range of social and economic realities in American life. New conceptions of childhood developed throughout the nineteenth century, culminating in images of young people as vulnerable beings whose future well-being could be highly influenced by their childhood experiences and the environments in which they are raised.[52] Immigration, industrialization, and urbanization throughout the century resulted in conditions that caught the attention of social reformers, whose parens patriae concern for the welfare of children perceived to be at risk was commingled with a desire to control the upbringing of children from disfavored segments of the nation's population.[53] Challenges to the previously impenetrable privacy of the family were increasingly tolerated, particularly if the parents in question

47. For most families, the law's influence on their lives may be most apparent when going through a family transition, such as entering marriage or, more dramatically, going through a divorce. In addition, for those whose family forms or relationships do not comport with traditional expectations of family life, the law's role in regulating family life may be more evident. For example, families with children headed by gay or lesbian adults may be painfully aware of the importance of the law's regulation of the family, as many struggle to obtain legal recognition for their family relationships. *See, e.g.*, Lois A. Weithorn, *Can a Subsequent Change in Law Void a Marriage that Was Valid at Its Inception? Considering the Legal Effect of Proposition 8 on California's Existing Same-Sex Marriages*, 60 HASTINGS L.J. 1063 (2009).

48. *See infra* notes 64–71 and accompanying text.

49. John E.B. Myers, *A Short History of Child Protection in America*, 42 FAM. L.Q. 449, 449–51 (2008) (noting that, before 1875, there was no organized public response to child abuse).

50. JOHN E.B. MYERS, CHILD PROTECTION IN AMERICA: PAST, PRESENT, AND FUTURE 11 (2006).

51. Tamar Morag, *Religious Tradition and the Corporal Punishment of Children: A Comparison of the American and Israeli Legal Systems*, 25 INT'L J.L. POL'Y & FAM. 338, 340–41 (2011).

52. STEVEN MINTZ, HUCK'S RAFT: A HISTORY OF AMERICAN CHILDHOOD 156–57, 162 (2004) (citing "shifting ideas about childhood," the "view of the child as an innocent creature who needed care and nurture," "a heightened emphasis on children's plasticity," and a "conception of children as weak, vulnerable, and defenseless").

53. *Id.* at 154–84.

appeared unsuited to the task of raising our country's future citizens.[54] Although developments specific to child protection did not evolve through the nineteenth and twentieth centuries in a linear fashion, reforms generally tracked broader societal themes and movements that related to de jure and de facto child and family policy in America.[55] By the second half of the twentieth century, child protection had become an important component of state and federal social agendas, ultimately resulting in the complex network of criminal and civil policies and agencies that now supervise various aspects of family life.[56]

Several developments in the twentieth century converged to create the modern child protection system. Among the most significant are the increased involvement of federal and state governments in the regulation of children's lives in a variety of spheres: the growth of government "welfare" programs to provide support to impoverished families,[57] new "scientific" understandings of child abuse via the dissemination of methods to diagnose "the battered child syndrome" through radiological and other medical techniques, the subsequent passage of child abuse reporting laws in the fifty states, and, in the last forty years, the enactment of a series of federal statutes providing policy leadership and funding to states in an effort to protect maltreated children.[58] And, as is often the case when the major policy changes "sweep" the nation, these transformations have been followed by criticism and reassessment of the philosophies, methods, and goals that constitute modern responses to concerns about endangered children.[59]

The nation became riveted on the issue of child abuse with the 1962 publication of a now-famous article entitled "The Battered Child Syndrome" in the *Journal of the American Medical Association.*[60] Using X-ray technology and other medical assessment techniques, physician C. Henry Kempe and his colleagues documented hundreds of cases in which children had been brought to hospitals repeatedly for various injuries and where parental explanations for injuries diverged from the diagnostic picture.[61] The narrative was haunting: "To the informed physician, the bones tell a story the child is too young or too frightened to tell."[62] The authors implored physicians to overcome their "emotional

54. *Id.* at 162–84.

55. Brenda G. McGowan, *Historical Evolution of Child Welfare Services*, *in* CHILD WELFARE FOR THE 21ST CENTURY: A HANDBOOK OF PRACTICES, POLICIES, AND PROGRAMS 10 (Gerald P. Mallon & Peg McCarty Hess eds., 2005).

56. *Id.* at 19–44.

57. *Id.* at 25–26.

58. *See infra* notes 60–68 and accompanying text.

59. *See infra* notes 69–86 and accompanying text.

60. *See* C. Henry Kempe et al., *The Battered Child Syndrome*, 181 JAMA 17 (1962).

61. *Id.*

62. *Id.* at 18.

unwillingness . . . to consider abuse as the cause of the child's difficulty" and urged them to intervene to protect children from the "expected repetition of trauma" and to prevent "further tragic injury or death."[63] The article left no doubt that the protective action required would be legal in nature, such as reporting the cases to police or child protective services. Kempe's research fundamentally changed the entire landscape of child protection.

Model reporting statutes were drafted within the next few years.[64] By 1967, all fifty states had enacted statutes that mandated physicians report suspected child maltreatment.[65] In the years that followed, the statutes were broadened, mandating reporting by a range of other professionals who work with children or their parents and expanding the definitions of what constitutes reportable maltreatment.[66] In 1974, the federal government took a leadership position with the Child Abuse Prevention and Treatment Act of 1974 ("CAPTA"), the first in a series of legislative efforts to encourage states to adopt various statutory provisions in order to qualify for federal child protection funds.[67] The model promoted by CAPTA was that of a coordinated national response to the problem of child maltreatment, implemented through state protective services agencies and the criminal justice system.[68]

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63. *Id.* at 18, 24.

64. *See, e.g.*, SETH C. KALICHMAN, MANDATED REPORTING OF SUSPECTED CHILD ABUSE: ETHICS, LAW, & POLICY 15 (2d ed. 1999); Margaret H. Meriwether, *Child Abuse Reporting Laws: Time for a Change*, 20 FAM. L.Q. 141 (1986).

65. Donald J. Besharov, *"Doing Something" About Child Abuse: The Need to Narrow the Grounds for State Intervention*, 8 HARV. J.L. & PUB. POL'Y 539, 542 (1985).

66. KALICHMAN, *supra* note 64, at 17–30.

67. 42 U.S.C. §§ 5101–5117aa-22 (2010).

68. McGowan, *supra* note 55, at 33–36. The modern child protection system is, in fact, two systems with overlapping jurisdiction: the criminal justice system and the dependency jurisdiction of the juvenile court system. Child abuse statutes exist in state penal codes, empowering law enforcement and court personnel to investigate cases, prosecute alleged offenders, and sentence those found guilty. *See, e.g.*, CAL. PENAL CODE § 273a (West 2011) (defining certain child abuse offenses and authorizing sentences of up to six years); John E.B. Myers, *Criminal Prosecution of Child Maltreatment*, *in* THE APSAC HANDBOOK ON CHILD MALTREATMENT 87 (John E.B. Myers ed., 3d ed. 2011) (providing an overview of the criminal justice system's child abuse jurisdiction). By contrast, the *dependency* system, which operates within the juvenile court, is a civil justice system, grounded in the state's parens patriae authority to promote the children's best interests. *See* John E.B. Myers, *Juvenile Court*, *in* THE APSAC HANDBOOK ON CHILD MALTREATMENT 53, 56–57 (John E.B. Myers ed., 3d ed. 2011). It seeks to protect children who have been harmed or are at risk of harm as a result of the actions or omissions of their parents, guardians, or other legally authorized or de facto caregivers, attempting to preserve the family unit and family relationships where appropriate and remedying the problems underlying the need for protective action. *See, e.g.*, ELLMAN ET AL., *supra* note 21, at 1204–23. Where the court determines that parents or guardians have failed to meet their responsibilities in creating a safe and minimally adequate home environment for the child according to the governing statutes, the court limits parental autonomy by substituting itself for the parents as legal decisionmakers for the child. *Id.* In addition to taking immediate actions to protect the child that may involve removal from parental custody, the government also pursues the parallel goal of remediating the home situation through offering rehabilitative services to parents. *Id.* at 1244–59. Where the system determines that the

As is often the case, however, government intervention proved not to be the panacea policymakers hoped it would be. CAPTA was amended over the years, and Congress passed other legislation related to abuse and neglect.[69] Each decade brought with it new emphases—each an attempt to respond to updated understandings of the phenomena of child maltreatment—to promulgate shifting philosophies of child protective services intervention,[70] or else to respond to criticisms of the ways in which child protection policy was implemented.[71] In addition, social biases continued to plague child protection policy and implementation. For example, in defining the grounds for the juvenile court's dependency jurisdiction,[72] state statutes must identify what types of parental conduct, living situations, or harm experienced by a child constitute maltreatment.[73] These determinations are necessarily policy decisions infused with social values as to what constitutes adequate parenting. Over the years, the breadth versus the specificity of statutory language, together with the categories of conduct and harm that are explicitly included in or excluded from such language, have served as a barometer for such social judgments.[74] At times, the system has been criticized for casting too broad a net and doing so in ways that disadvantage racial, ethnic, and cultural minorities, not to mention those living in poverty.[75]

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circumstances are such that safe return to the family in the foreseeable future is not a feasible goal, hope of family reunification may be abandoned and parental rights may be permanently severed by the court, freeing the child for adoption. *Id.* at 1259–75.

69. The most recent reauthorization of CAPTA was in 2010. CAPTA Reauthorization Act of 2010, Pub. L. No. 111-320, 124 Stat. 3459 (Dec. 20, 2010). For a historical analysis and summary of federal child abuse legislation as amended since 1974, see U.S. Dep't of Health & Human Servs., *Major Federal Legislation Concerned with Child Protection, Child Welfare, and Adoption*, CHILD WELFARE INFORMATION GATEWAY (Apr. 2011), http://www.childwelfare.gov/pubs/otherpubs/majorfedlegis.pdf.

70. For a discussion of the shifting philosophical movements reflected in federal child abuse legislation, see LELA B. COSTIN ET AL., THE POLITICS OF CHILD ABUSE IN AMERICA 117–32 (1996); Robert M. Gordon, *Drifting Through Byzantium: The Promise and Failure of the Adoption and Safe Families Act of 1997*, 83 MINN. L. REV. 637, 641–57 (1999).

71. For a discussion of the criticisms leveled at the child protection system for failures in implementing its mandates, see, for example, COSTIN ET AL., *supra* note 70, at 135–65; Michael S. Wald, *State Intervention on Behalf of "Neglected" Children: Standards for Removal of Children from Their Homes, Monitoring the Status of Children in Foster Care, and Termination of Parental Rights*, 28 STAN. L. REV. 623, 636–38 (1976).

72. *See supra* note 68.

73. *See, e.g.*, CAL. WELF. & INST. CODE § 300 (West 2011).

74. Thus, for example, social attitudes toward corporal punishment or religious refusals of medical care may be reflected in the language of statutes. *See, e.g.*, *id.* § 300(a) (excluding from the purview of the physical abuse provision spanking to the buttocks that does not cause serious physical injury and is reasonable and age-appropriate); *id.* § 300(b) (exempting from its definition of medical neglect certain decisions by parents to reject medically recommended treatments if the parents' decisions were motivated by religious beliefs).

75. During hearings in the 1970s, Congress considered data indicating "that 25 to 35% of all Indian children had been separated from their families and placed in adoptive families, foster care, or institutions" as a result of the intervention of state child welfare authorities. *See* Miss. Band of

However, these developments in federal and state law did succeed in bringing more cases of child maltreatment to the attention of government authorities. Reports of suspected child maltreatment increased dramatically during the 1970s and 1980s.[76] Whether the observed increases in the 1970s and 1980s reflected changes in the prevalence of child maltreatment or in the likelihood that existing cases would be reported, growing numbers of children and families came within the jurisdiction of those authorities empowered to respond.[77] The rate appears to have peaked in 1993, dropped over the next six years, and more or less stabilized during the early 2000s.[78]

Choctaw Indians v. Holyfield, 490 U.S. 30, 32 (1989) (citing *Problems That American Indian Families Face in Raising Their Children and How These Problems Are Affected by Federal Action or Inaction: Hearing Before the Subcomm. on Indian Affairs of the S. Comm. on Interior and Insular Affairs*, 99th Cong. 3 (1974) (statement of William Byler, Executive Director, Association on American Indian Affairs)). Furthermore, the evidence revealed that the "adoption rate of Indian children was eight times that of non-Indian children. Approximately 90% of the Indian placements were in non-Indian homes." *Id.* at 33. Congress enacted the Indian Child Welfare Act in 1978, 25 U.S.C. §§ 1901–63 (2000), in an attempt to shield Indian parents from the intervention of child protection workers who are unfamiliar with Indian culture and childrearing traditions. *Miss. Band of Choctaw Indians*, 490 U.S. at 34–35. The statute's goal was to promote tribal sovereignty in decisionmaking over the welfare of Indian children. *Id.* The overrepresentation of children of color and children from impoverished families in the caseload of child protection services remains a serious problem. *See generally* DOROTHY ROBERTS, SHATTERED BONDS: THE COLOR OF CHILD WELFARE (2002); Bruce A. Boyer & Amy E. Halbrook, *Advocating for Children in Care in a Climate of Economic Recession: The Relationship Between Poverty and Child Maltreatment*, 6 NW. J.L. & SOC. POL'Y 300 (2011); Debra Paruch, *The Orphaning of Underprivileged Children: American's Failed Child Welfare Law & Policy*, 8 J.L. & FAM. STUD. 119 (2006); *Symposium on Race, Culture, Class, and Crisis in Child Welfare: Theory into Practice*, 81 ST. JOHN'S L. REV. 515 (2000).

76. Various estimates of child maltreatment reports have been published. According to one source, annual reports of child abuse had increased from ten thousand in 1962 to almost three million in 1992. DUNCAN LINDSEY, THE WELFARE OF CHILDREN 8 (1994). The number of children reported nationally rose by over 347% between 1976 and 1993. Patricia A. Schene, *Past, Present, and Future Roles of Child Protective Services*, 8 FUTURE CHILDREN: PROTECTING CHILDREN FROM ABUSE & NEGLECT 23, 29 (1998).

77. Fred Wulczyn, *Epidemiological Perspectives on Maltreatment Prevention*, 19 FUTURE CHILDREN: PREVENTING CHILD MALTREATMENT 39, 48–49 (2009).

78. The most reliable data are those collected after the 1990s, when states started participating more in data collection. *Id.* According to the Department of Health and Human Services, during the fiscal year 2010, approximately 3.3 million reports of alleged maltreatment of approximately 5.9 million children (or 43.8 per 1,000 children) were received by state child protection services agencies. U.S. DEP'T OF HEALTH & HUMAN SERVS., CHILD MALTREATMENT 2010 5–6 (2011), [hereinafter AFCARS Report]. Child Protective Services chose to investigate slightly less than 1.8 million of these cases, resulting in findings of substantiated maltreatment in 436,321 cases. Because many cases involve more than one child (that is, there is more than one child at risk in a particular home or involved in a given report), the number of children identified by the Department of Health and Human Services as "victims" of child maltreatment during 2010 is 695,000. *Id.* at 22. The actual number of incidents of child maltreatment in a given year, however, is likely much higher, because not all cases are reported to authorities. David Finkelhor et al., *The Victimization of Children and Youth: A Comprehensive, National Survey*, 10 CHILD MALTREATMENT 5, 5 (2005). Using different survey measures and methods, a 2005 study extrapolated from its sample of over 2000 families, and concluded that during the survey year (2002–2003), approximately 8.7 million children in the United States were maltreated. *Id.* at 12. In

During the 1960s and 1970s, child welfare agencies increasingly focused on investigating and intervening in cases of reported child maltreatment, beginning their transformation into the child protective services agencies we are familiar with today.[79] Sadly, modern child protection agencies are now, to some extent, "driven" by their mandate to investigate reported cases, with the result that "investigation often seems to occur for its own sake, without any realistic hope of meaningful treatment to prevent the recurrence of maltreatment or to ameliorate its effects, even if the report of suspected maltreatment is validated."[80] In addition, the U.S. Advisory Board on Child Abuse and Neglect has observed that child protection policy in the United States is "largely unplanned; it has consisted primarily of ad hoc responses to crises."[81] In 1990, the Board asserted that "the system the nation has devised to respond to child abuse and neglect is failing."[82]

The ability of the legal system and our society to protect children from maltreatment is undercut by our ambivalence about intervening in the family. We perceive respect for family integrity to be inexorably adverse to our interest in protecting children from harm while in the care of their parents. The letter and application of American child protection law reflects the resulting ambivalence, leading to poorly constructed and clumsily implemented policies that interfere too intrusively into some families' lives, while too often failing to adequately protect children. We vacillate between solutions that are polar opposites: Families are either exclusively left to their own devices—to struggle to provide adequate and safe homes and environments against sometimes overwhelming odds—or the state coercively intervenes, often removing children from the family

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2009, a team of researchers reviewed the literature on the prevalence of child maltreatment in the United States, Great Britain, Canada, and Australia, finding that community-based surveys relying on child maltreatment victims' or their parents' self-reports reveal "ten-fold higher rates of maltreatment" than do child protection agency statistics. Ruth Gilbert et al., *Burden and Consequences of Child Maltreatment in High-Income Countries*, 373 LANCET 68, 69 (2009).

79. McGowan, *supra* note 55, at 28–33.

80. *See* U.S. ADVISORY BD. ON CHILD ABUSE & NEGLECT, U.S. DEP'T OF HEALTH & HUMAN SERVS., NEIGHBORS HELPING NEIGHBORS: A NEW NATIONAL STRATEGY FOR THE PROTECTION OF CHILDREN 9–10 (1993) (available from the Superintendent of Documents, U.S. Government Printing Office).

81. U.S. ADVISORY BD. ON CHILD ABUSE & NEGLECT, U.S. DEP'T OF HEALTH & HUMAN SERVS., CREATING CARING COMMUNITIES: BLUEPRINT FOR AN EFFECTIVE FEDERAL POLICY ON CHILD ABUSE AND NEGLECT xi (1991) (available from the Superintendent of Documents, U.S. Government Printing Office).

82. U.S. ADVISORY BD. ON CHILD ABUSE & NEGLECT, U.S. DEP'T OF HEALTH & HUMAN SERVS., CHILD ABUSE AND NEGLECT: CRITICAL FIRST STEPS IN RESPONSE TO A NATIONAL EMERGENCY vii (1990) (emphasis in original) (available from the Superintendent of Documents, U.S. Government Printing Office). Among the Advisory Board's conclusions was that "child abuse and neglect in the United States now represents a national emergency," in part because "in spite of the nation's avowed aim of protecting its children, each year hundreds of thousands of them are still being starved and abandoned, burned and severely beaten, raped and sodomized, berated and belittled." *Id.* The Board underscored the absence of effective preventive and intervention strategies. *Id.* at xii–xv.

home. While the system may intervene too quickly and aggressively in some cases, it hesitates to intervene in others, even where observers believe that the dangers to children ultimately killed or seriously harmed should have been known.[83] The child protection system continues to manifest ambivalence even when it has decided to intervene. Children may spend years, sometimes much of their minority, bouncing back and forth between their parents and a series of foster care placements.[84] Although federal initiatives seek to provide greater permanency and stability for children in the protective services system through more timely termination of parental rights and adoption,[85] empirical assessments suggest that the success of these initiatives is mixed, and that there have been some unanticipated consequences.[86]

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83. *See, e.g.*, ELLMAN ET AL., *supra* note 21, at 1301–03.

84. Smith v. Org. of Foster Families for Equal. & Reform, 431 U.S. 816, 835–36 (1977) ("[C]hildren often stay in 'temporary' foster care for much longer than contemplated by the theory of the system, . . . [and] many children apparently remain in this 'limbo' indefinitely."). Howard Davidson, director of the American Bar Association's Center on Children and the Law, observed that despite reforms in the 1980s and 1990s to reduce the phenomenon of "foster care limbo," there remains "justifiable congressional concern that too many children" still languish in foster care at the end of the twentieth century. Howard Davidson, *Child Protection Policy and Practice at Century's End*, 33 FAM. L.Q. 765, 771 (1999). Children in foster care in the United States on September 30, 2010, had an average of 3.1 placement changes during their time in foster care. *Foster Care by the Numbers*, CASEY FAMILY PROGRAMS (2011). For a discussion and empirical examination of the problem of placement instability in the foster care system, see generally David M. Rubin et al., *Placement Stability and Mental Health Costs for Children in Foster Care*, 113 PEDIATRICS 1336 (2004); *see also* Joseph S. Jackson & Lauren G. Fasig, *The Parentless Child's Right to a Permanent Family*, 46 WAKE FOREST L. REV. 1, 33–36 (2011).

85. In 1997, Congress passed the Adoption and Safe Families Act in an attempt to minimize children's extended placements in foster care. The Act contains several provisions creating financial incentives for states to act more quickly in child maltreatment cases to establish permanency for children. For example, in order to continue to receive federal funding for child welfare services, states must petition for termination of parental rights in the cases of children who have been in foster care for fifteen of the preceding twenty-two months. 42 U.S.C. § 675(5)(E) (2010).

86. Initial empirical analyses suggest that, while the Adoption and Safe Families Act ("ASFA") has increased the numbers of children whose parents' rights have been terminated, some groups of children, now legal orphans, do not have viable adoption prospects:

> Preliminary research . . . suggests that policy changes that ASFA instigated have combined with other ongoing trends to generate a meaningful increase in the rate of adoption of young children. The impact of ASFA is less clear regarding older children. The number of children awaiting adoption has not declined with the growth in adoptions. The U.S. Department of Health and Human Services identified more than 125,000 children as waiting for adoption in 2001, up from 122,000 just a few years before. Children over the age of six comprise nearly all of this increase. The numbers of children who are in this waiting status include a substantial proportion who have had parental rights terminated, but do not even have a record of an active adoption case.
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> . . . .
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> When [terminations of parental rights] are followed by adoption into a lifetime family, it contributes to the goal of having children move into legally permanent homes. But if it fails, it may result in children who have no legal relationship to any parents or guardians.

Is this tension irreconcilable? Are the interests of the state and parents whose children's welfare may be at risk necessarily adversarial? The goals of respecting family autonomy and protecting children from harm are not necessarily in conflict, even where parental conduct may place children's welfare at risk. Most of the time, the interests of the state and parents are in harmony. The law generally does not dispute this; its default presumption of parental action in children's best interests is consistent with such a view. However, our traditional *responses* to perceived dangers to children from within the family—waiting to react until a child *is* in danger and then responding highly intrusively, often with removal of the child—*force* a contest between the state and the family. By the time the family has caught the attention of the government, circumstances are likely to have deteriorated to the point where the relationship is or will become adversarial. A strategy that reserves state involvement for the very last possible moment—the point at which the harms or risks of harm to the children in question are sufficiently grave and sufficiently likely to justify intrusion into the family—makes sense only where state involvement presents as coercive violation of family privacy. In these latter circumstances, the danger to children must be exceptionally high to permit such a violation. However, everything we know about the effects of child maltreatment suggests that the earlier we intervene the better the results.[87] Indeed, by the time conditions in a child's home trigger state intervention under our current reactive policies, the deleterious effects of the problematic conditions in the home on the child's development may already be quite profound.

Is it possible to reorient the timing of state involvement, providing assistance to the child and family far earlier, perhaps before the child has suffered deleterious effects (or suffered fewer such effects) and to do so in a way that does not intrude in family privacy? Perhaps. Empirical research may help inform this inquiry. American law provides the starting points of our policy analysis by identifying the cherished goals of protecting the integrity of the family and the welfare of children. Questions of *how* we can best achieve these goals are, however, empirical to some extent. The answers involve our understandings of human behavior, functioning, relationships, and the effects of particular programs and interventions. While it is important not to overstate the

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Richard Barth et al., *From Anticipation to Evidence: Research on the Adoption and Safe Families Act*, 12 VA. J. SOC. POL'Y & L. 371, 392–95 (2005) (citations omitted); *see also* Martin Guggenheim, *The Effects of Recent Trends to Accelerate the Termination of Parental Rights of Children in Foster Care—An Empirical Analysis in Two States*, 29 FAM. L.Q. 121 (1995); Martin Guggenheim, *The Foster Care Dilemma and What to Do About It: Is the Problem That Too Many Children Are Not Being Adopted Out of Foster Care or That Too Many Children Are Entering Foster Care?*, 2 U. PA. J. CONST. L. 141 (1999).

87. *See infra* notes 144–158 and accompanying text.

contributions that science can make to law, it is equally important that policymakers not rely solely on untested assumptions about human behavior as the basis of intervention strategies.

Standard child protection interventions reflect but a very narrow band of the universe of potential responses. There are other approaches—indeed wholly different philosophies—that operate on the presumption that the interests of parent and state converge—even where children's welfare is at risk. A model grounded on a parent-state partnership formed around common concerns in childrearing and socialization, rather than as a struggle over adverse interests, may better meet the needs of children, parents, and the larger community.[88] Intervention strategies that focus on providing assistance to families as early and as non-intrusively as possible—ideally before the child's welfare is in immediate danger—offer children a greater likelihood of protection from harm than do the strategies characterizing our current child protection system. Reconstruction of our dominant intervention strategies so that they are compatible with, rather than antagonistic to, respect for parental autonomy and the integrity of the family unit may help extricate our nation's child protection response from the ambivalence and inefficacy in which it is currently mired.

In the face of the myriad criticisms of the child protection system, commentators do not suggest dismantling the system.[89] The nation, through federal, state, and local policies, has assumed some measure of responsibility for the protection of children who are at risk of harm while in the care of adults, and most observers agree that this is, in principle, a good thing. There remains, however, substantial disagreement as to when and how child protective services should intervene in families to protect children's safety and well-being. Insufficient emphasis has been placed on how to intervene *effectively* with affected families. For most of the history of the child protection system, empirical investigation of the efficacy of traditional child welfare responses has been the exception rather than the rule, creating uncertainty as to the impact of formal, informal, and innovative child protection system intervention on the lives

88. *See generally* Maxine Eichner, *Children, Parents, and the State: Rethinking Relationships in the Child Welfare System*, 12 VA. J. & SOC. POL'Y L. 448 (2005); *see also* Barbara Bennett Woodhouse, *A Public Role in the Private Family: The Parental Rights and Responsibilities Act and the Politics of Child Protection and Education*, 57 OHIO ST. L.J. 393, 394–95 (1996); Barbara Bennett Woodhouse, *Reframing the Debate About the Socialization of Children: An Environmentalist Paradigm*, 2004 U. CHI. LEGAL F. 85, 85–92 (2004).

89. Critics of the current system lean instead to proposing changes in the system's structure and functioning. *See, e.g.*, COSTIN, *supra* note 70, at 171–89 (proposing a restructuring of the system); Mary B. Larner et al., *Protecting Children from Abuse and Neglect: Analysis and Recommendations*, 8 FUTURE CHILDREN: PROTECTING CHILDREN FROM ABUSE & NEGLECT 4, 9–19 (1998) (proposing changes to focus and strengthen the system).

of the affected children and families.[90] Fortunately, in recent years, increased interest in empirically grounded practices is beginning to encourage scientific investigation of both traditional and innovative approaches.[91] This trend, while promising, is in its earliest phases; there are few definitive findings, and integration of meaningful findings beyond pilot programs and demonstration projects presents its own challenges. However, an increased reliance on empiricism may help the system develop in new directions that better achieve the law's goals while reducing unintended consequences of state action. In the Parts that follow, I touch on some of the findings from recent studies in developmental neuroscience and explore the implications of these studies for child protection system reform.

III. THE EFFECTS OF CHILD MALTREATMENT

We have known for some time that child maltreatment can have deleterious effects on its victims beyond the direct physical effects of the abuse or neglect.[92] Maltreated children may manifest delays and impairments on a range of physical and psychological indices. For example, children may exhibit cognitive, social, and emotional difficulties in various settings, such as at school, at home, and in the community.[93] When contrasted with persons who did not experience maltreatment as children, those who were maltreated reveal higher rates of adult psychopathology and a greater likelihood of engaging in maladaptive and socially disruptive courses of conduct as adults (such as engaging in

90. *See generally* FRED WULCZYN ET AL., BEYOND COMMON SENSE: CHILD WELFARE, CHILD WELL-BEING, AND THE EVIDENCE FOR POLICY REFORM (2005); Gary B. Melton et al., *Empirical Research on Child Maltreatment and the Law*, 24 J. CLINICAL CHILD PSYCHOL. 47 (1995); Ross A. Thompson & Brian L. Wilcox, *Child Maltreatment Research: Federal Support and Policy Issues*, 50 AM. PSYCHOL. 789 (1995). For a discussion of the challenges in assessing the efficacy of child protection interventions, see MICHAEL S. WALD ET AL., PROTECTING ABUSED AND NEGLECTED CHILDREN 181–200 (1988).

91. For a discussion of some of these approaches see, for example, CHILD WELFARE RESEARCH: ADVANCES FOR PRACTICE AND POLICY (Duncan Lindsey & Aron Shlonsky eds., 2008); GARY B. MELTON, ROSS A. THOMPSON & MARK A. SMALL, TOWARD A CHILD-CENTERED, NEIGHBORHOOD-BASED CHILD PROTECTION SYSTEM: A REPORT OF THE CONSORTIUM ON CHILDREN, FAMILIES, AND THE LAW (2002); PREVENTING CHILD MALTREATMENT: COMMUNITY APPROACHES (Kenneth A. Dodge & Doriane Lambelet Coleman eds., 2009).

92. *See, e.g.*, JILL GOLDMAN ET AL., U.S. DEP'T OF HEALTH & HUMAN SERVS., A COORDINATED RESPONSE TO CHILD ABUSE AND NEGLECT: THE FOUNDATION OF PRACTICE 35–39 (2003); NAT'L RESEARCH COUNCIL, UNDERSTANDING CHILD ABUSE AND NEGLECT 208–52 (1993).

93. *See, e.g.*, U.S. DEP'T OF HEALTH & HUMAN SERVS., LONG-TERM CONSEQUENCES OF CHILD ABUSE AND NEGLECT, (2008) [hereinafter LONG-TERM CONSEQUENCES]; GOLDMAN, ET AL., *supra* note 92, at 37; Dante Cicchetti & Sheree L. Toth, *Child Maltreatment*, 1 ANN. REV. CLINICAL PSYCHOL. 409, 416–23 (2005); Barbara Thomlison, *A Risk and Protective Factor Perspective*, *in* RISK AND RESILIENCE IN CHILDHOOD: AN ECOLOGICAL PERSPECTIVE 89, 90–91 (Mark W. Fraser ed., 2d ed. 2004). For more specific discussion of the types of difficulties that may follow from different forms of child maltreatment, see, for example, chapters in Parts II, III, and IV of THE APSAC HANDBOOK ON CHILD MALTREATMENT (John E.B. Myers ed., 3d ed. 2011).

substance abuse or violating criminal law).[94] Some proportion of individuals who have experienced child maltreatment perpetuate these patterns in interactions with their own children, although there has been debate in the field as to the prevalence of such intergenerational transmission of these dysfunctional patterns.[95]

Research in recent years has also revealed that individuals maltreated as children are more likely than the general population to develop serious and life-threatening health conditions, such as heart and lung disease,[96] and may have shorter lifespans than non-maltreated peers.[97] For example, the CDC has sponsored a body of longitudinal studies, referred to collectively as the Adverse Childhood Experiences ("ACEs") research, which evaluates the impact of certain experiences on long-term development.[98] The adverse experiences studied by the investigators include childhood exposure to various forms of child maltreatment (for example, emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect) and household dysfunction (for example, the presence of violence against one's mother, mental illness of a household

94. *See, e.g.*, LONG-TERM CONSEQUENCES, *supra* note 93; GOLDMAN ET AL., *supra* note 92, at 38; Robert F. Anda et al., *The Enduring Effects of Abuse and Related Adverse Experiences in Childhood: A Convergence of Evidence from Neurobiology and Epidemiology*, 256 EUR. ARCHIVES PSYCHIATRY & CLINICAL NEUROSCI. 174, 180 (2006) (summarizing findings of psychological symptomatology and substance abuse in populations with exposure to maltreatment in childhood); Stephan Collishaw et al., *Resilience to Adult Psychopathology Following Childhood Maltreatment: Evidence from a Community Sample*, 31 CHILD ABUSE & NEGLECT 211, 212, 223–24 (2007) (reporting higher rates of recurrent depression, suicidal behavior, posttraumatic stress disorder, and substance abuse in adults who had experienced child maltreatment); Christine Heim et al., *Neurobiological and Psychiatric Consequences of Child Abuse and Neglect*, 52 DEVELOPMENTAL PSYCHOBIOLOGY 671, 672–73 (2010) (summarizing findings of clinical consequences of child abuse and neglect, indicating that an increase in the severity, frequency, and duration of maltreatment increases the likelihood of developing depression or another psychological disorder).

95. For a discussion of debates and methodological limitations, see, for example, Jay Belsky, *Etiology of Child Maltreatment: A Developmental-Ecological Analysis*, 114 PSYCHOL. BULL. 413 (1993), and Cathy Spatz Widom, *The Intergenerational Transmission of Violence*, *in* PATHWAYS TO CRIMINAL VIOLENCE (N.A. Weinger & M.E. Wolfgang eds., 1988). For more recent findings, see generally Rand D. Conger et al., *The Intergenerational Transmission of Parenting: Closing Comments for the Special Section*, 45 DEV. PSYCHOL. 1276 (2009).

96. Anda et al., *supra* note 94, at 181; Vincent J. Felitti et al., *Relationship of Childhood Abuse and Household Dysfunction to Many of the Leading Causes of Death in Adults: The Adverse Childhood Experiences (ACE) Study*, 14 AM. J. PREVENTIVE MED. 245, 250 (1998) (finding a strong relationship between the number of childhood exposures of adverse experiences, such as child maltreatment and household dysfunction, and diseases that are leading causes of death in adults, such as heart disease, cancer, chronic bronchitis, and emphysema).

97. David W. Brown et al., *Adverse Childhood Experiences and the Risk of Premature Mortality*, 37 AM. J. PREVENTIVE MED. 389, 394 (2009).

98. "More than 17,000 Health Maintenance Organization (HMO) members undergoing a comprehensive physical examination chose to provide detailed information about their childhood experience of abuse, neglect, and family dysfunction. To date, more than 50 scientific articles have been published and more than 100 conference and workshop presentations have been made." *Adverse Childhood Experiences (ACE) Study*, CTRS. FOR DISEASE CONTROL & PREVENTION, http://www.cdc.gov/ace/index.htm (last visited July 1, 2012).

member, substance abuse by a household member, incarceration of a household member, or parental divorce or separation).[99] This research has spawned dozens of publications focusing on a broad range of the long-term consequences of childhood adverse experiences, including development of medical conditions, psychopathology, and lifestyle patterns (for example, smoking or substance abuse).[100] The findings are striking: There is a powerful and direct relationship between the number of adverse childhood experiences and

> multiple risk factors for several of the leading causes of death in adults. Disease conditions including ischemic heart disease, cancer, chronic lung disease, skeletal fractures, and liver disease, as well as poor self-rated health also showed a graded relationship to the breadth of childhood exposures. The findings suggest that the impact of these adverse childhood experiences on adult health status is strong and cumulative.[101]

The findings of a recent study with children examining the impact of ACEs on functioning indicate that some of the effects of these experiences manifest during minority.[102] The ACEs researchers theorize that the epidemiological trends they have observed are consistent with neurobiological findings reported in the literature[103] (and discussed in Part III.C below).[104] Those findings include small hippocampal volume and deficits in cognitive function in adults who experienced early, abuse-related, posttraumatic stress disorder ("PTSD").[105]

Two cautions must guide interpretations of the effects of child maltreatment or traumatic childhood experiences observed in the wide range of studies in the database. First, most of this research involving human participants examines *associations* among variables and thus does not necessarily demonstrate *causality*. The various research methodologies identify relationships among variables, such as between child maltreatment and various outcomes. Investigators can make inferences regarding causality, but those inferences may be difficult to confirm. Many other factors affecting development, such as poverty, poor nutrition, limited access to health care, domestic violence, and community violence, co-occur

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99. *See, e.g.*, Felitti et al., *supra* note 96, at 248.

100. For a list of publications by outcome, see *Adverse Child Experiences (ACE) Study*, *supra* note 98.

101. Felitti et al., *supra* note 96, at 251. For a further discussion of this relationship, see Anda et al., *supra* note 94, at 180–83.

102. Nadine J. Burke et al., *The Impact of Adverse Childhood Experiences on an Urban Pediatric Population*, 35 CHILD ABUSE & NEGLECT 408, 411–13 (2011). Burke and her colleagues found that children who reported four or more adverse experiences had a significantly higher likelihood of diagnosis with learning or behavior problems or obesity than did children who did not report adverse life experiences. *Id.*

103. Anda et al., *supra* note 94, at 175.

104. *See infra* notes 159–212 and accompanying text.

105. *See infra* notes 173–212 and accompanying text.

in families where child maltreatment is present. There is much to learn about the complex interactions among life experiences and the various biological, psychological, and social systems, particularly when positing causation.[106] The experimental methodology that would permit the strongest inferences regarding causation (that is, randomly assigning children to conditions of maltreatment, while holding other relevant variables constant) is, of course, morally and ethically impermissible.[107]

Second, and importantly, although individuals who experience child maltreatment may have a greater risk of developing difficulties, many factors operate to influence these outcomes. The type, severity, duration, timing, and chronicity of maltreatment, one's prior exposure to life stressors, and a host of biological, psychological, and social factors interact to influence the impact of maltreatment on a given individual's well-being.[108]

In the last several decades, researchers have focused attention on the concept of "resilience."[109] "Resilience is a dynamic developmental process that has been operationalized as an individual's attainment of positive adaptation and competent functioning despite having experienced chronic stress or detrimental circumstances, or following exposure to prolonged or severe trauma."[110] "Implicit within this notion are two critical conditions:

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106. Despite the interpretive challenges, the ACEs researchers suggest that the convergent evidence relating to the effects of child maltreatment is so strong that it supports an inference of causality:

> The argument for a causal relationship between ACEs and a variety of outcomes is strengthened by the combined evidence from neurobiology and epidemiology. This argument is important because evidence of causation affects decisions about prognosis, diagnosis, and treatment and can enhance understanding of the role of the childhood stressors on the developing brain in producing changes in affect, behavior, and cognition.

Anda et al., *supra* note 94, at 182.

107. *Id.* at 178–81; Regina Sullivan, *The Neurobiology of Attachment to Nurturing and Abusive Caregivers*, 63 HASTINGS L.J. 1553, 1567 (2012).

108. *See, e.g.*, Anda et al., *supra* note 94, at 176–81 (hypothesizing and finding a "dose-response" relationship between adverse childhood experiences such as maltreatment and the manifestation of long-term health and behavioral problems); Cicchetti & Toth, *supra* note 93, at 415–16, 426–28 (emphasizing the interaction of factors affecting outcomes of child maltreatment); Collishaw et al., *supra* note 94, at 214, 223–27 (finding that the likelihood of adult psychopathology varied with "the characteristics and severity of abuse"); Jody Todd Manley et al., *Dimensions of Child Maltreatment and Children's Adjustment: Contributions of Developmental Timing and Subtype*, 13 DEV. & PSYCHOPATHOLOGY 759, 779–80 (2001).

109. *See generally* RESILIENCE IN CHILDREN (Barry M. Lester et al. eds., 2006); RISK AND RESILIENCE IN CHILDHOOD: AN ECOLOGICAL PERSPECTIVE (Mark W. Fraser ed., 2d ed. 2004); Suniya Luther et al., *The Construct of Resilience: A Critical Evaluation and Guidelines for Future Work*, 71 CHILD DEV. 543 (2000).

110. Dante Cicchetti & Jennifer A. Blender, *A Multiple-Level-of-Analysis Perspective on Resilience: Implications for the Developing Brain, Neural Plasticity, and Preventive Interventions*, *in* RESILIENCE IN CHILDREN 248, 249 (Barry M. Lester et al. eds., 2006). Ann Masten has recently provided the following "broader" definition of resilience: "[t]he capacity of a dynamic system to withstand or recover from significant challenges that threaten its stability, viability, or development."

(1) exposure to significant threat or adversity; and (2) the achievement of positive adaptation despite major assaults on the developmental process."[111] In other words, some individuals manage to emerge with positive psychological or physical outcomes despite circumstances that create risks of negative outcomes.[112] Over the past several decades, theoretical and empirical perspectives on "resilience" have evolved.[113] While early work emphasized identifying personal "attributes of the children themselves" that promoted resilience, researchers then expanded their inquiry to incorporate a search for "protective" factors in children's family environments and broader social worlds.[114] Among those factors consistently identified as promoting healthier outcomes is a close, positive relationship with a caregiver.[115] In recent decades, scholarship has also focused on understanding the processes and mechanisms of resilience, as well as developing interventions to promote positive outcomes.[116] The field has increasingly conceptualized resilience as a product of dynamic[117] person-environment interactions[118] and focused on analysis and integration of multiple levels of functioning (for example, neurobiological, genetic, behavioral, and social dimensions).[119] As scholars continue to refine conceptual and methodological approaches, studies of resilience remind us that development of the detrimental outcomes associated with child maltreatment are neither universal nor inevitable.

Developmental neuroscience may help us understand how and why some of the negative psychological, behavioral, and health effects occur and elucidate the neurobiological pathways that lead to dysfunction or

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Ann S. Masten, *Resilience in Children Threatened by Extreme Adversity: Frameworks for Research, Practice, and Translational Synergy*, 23 DEV. & PSYCHOPATHOLOGY 493, 494 (2011).

111. Luthar et al., *supra* note 109, at 543.

112. Michael Rutter, *Implications of Resilience Concepts for Scientific Understanding*, *in* RESILIENCE IN CHILDREN 1, 1–2 (Barry M. Lester et al. eds., 2006).

113. Luthar et al., *supra* note 109, at 554–55; Ann S. Masten & Jelena Obradovic, *Competence and Resilience in Development*, *in* RESILIENCE IN CHILDREN 13, 13–14 (Barry M. Lester et al. eds., 2006).

114. Mark F. Fraser et al., *Risk and Resilience in Childhood*, *in* RISK AND RESILIENCE IN CHILDHOOD: AN ECOLOGICAL PERSPECTIVE 13, 27–31 (Mark W. Fraser ed., 2d ed. 2004) (discussing concepts of "protective" factors); Luthar et al., *supra* note 109, at 545.

115. Collishaw et al., *supra* note 94, at 214, 223–26 (observing the protective effects of positive relationships with one's parents, friends, and partners on the likelihood that those experiencing maltreatment in childhood develop psychopathology); Masten & Obradovic, *supra* note 113, at 21–22.

116. *See generally* Luthar et al., *supra* note 109; Masten & Obradovic, *supra* note 113, at 13.

117. The term "dynamic" reminds us that as individuals develop and interact with their environments and as circumstances change, so do the effects of adverse experiences on individuals. Thus, assessments of resilience may change over time and across situations and domains of functioning. *See generally* Luthar et al., *supra* note 109.

118. For example, Richard Lerner emphasizes that resilience might best be conceptualized as "bidirectional . . . . person-context exchanges that are mutually beneficial for the individual and his or her setting" rather than as an attribute of the individual. Richard M. Lerner, *Resilience as an Attribute of the Developmental System*, *in* RESILIENCE IN CHILDREN 40, 40–41 (Barry M. Lester et al. eds., 2006).

119. Cicchetti & Blender, *supra* note 110, at 250, 254–57; Masten & Obradovic, *supra* note 113, at 23–24.

deficit. Furthermore, and equally as important, developmental neuroscience may also illuminate the pathways of resilience and recovery. This knowledge may open the door to preventive and interventional strategies built on the integration of biological, behavioral, and social perspectives.

In the discussion below, I briefly summarize some of the findings and analyses relevant to the neurobiological effects of child maltreatment. In so doing, I touch on several themes: (1) notions of "toxic stress" and "allostatic load," (2) the interaction of toxic stressors with developmental processes, (3) neuroscientific findings on the effects of child maltreatment or childhood trauma on the brain, and (4) the particularized impact of maltreatment by one's primary caregiver as a stressor.

A. "TOXIC STRESS" AND "ALLOSTATIC LOAD"

Research on the effects of child maltreatment on children's development and functioning has increasingly focused on the neurobiological effects of abuse and neglect. A key theme is the characterization of child maltreatment as a stressor that can have long-term "toxic" effects on the brain and, ultimately, the entire organism.[120] Not all stress is deleterious to children's functioning. The National Scientific Council on the Developing Child, and—following the Council's lead—the American Academy of Pediatrics and U.S. Department of Health and Human Services, distinguish among the possible effects of different levels of stress.[121] Whether the stress experienced by a child has an effect that is "positive," "tolerable," or "toxic" depends on the interactions among characteristics of the stressors (for example, strength, frequency, and chronicity), characteristics of the child, and the mitigating or protective features of that child's circumstances.[122] Thus, for example,

120. Comm. on Psychosocial Aspects of Child & Family Health et al., *Policy Statement: Early Childhood Adversity, Toxic Stress, and the Role of the Pediatrician: Translating Developmental Science into Lifelong Health*, 129 PEDIATRICS e224, e227–29 (2011) [hereinafter AAP, *Policy Statement*]; Jack P. Shonkoff et al., *The Lifelong Effects of Early Childhood Adversity and Toxic Stress: Technical Report*, 129 PEDIATRICS e232, e234 (2011); Nat'l Sci. Council on the Developing Child, *Excessive Stress Disrupts the Architecture of the Developing Brain*, 1 (Harvard Univ. Ctr. on the Developing Brain, Working Paper No. 3, 2005), *available at* http://developingchild.harvard.edu/resources/reports_and_working_papers/working_papers/wp3/.

121. *See supra* note 120; *see also* JENNIFER S. MIDDLEBROOKS & NATALIE C. AUDAGE, THE EFFECTS OF CHILDHOOD STRESS ON HEALTH ACROSS THE LIFESPAN (2008).

122. In a 2005 Working Paper, the National Scientific Council on the Developing Child defined "positive stress" as "moderate, short-lived stress responses" to the types of challenges normally encountered as a part of daily life, such as entering a new child care setting or school. Nat'l Sci. Council on the Developing Child, *supra* note 120. Learning to manage such stress is an important facet of healthy psychological development and promotes a child's sense of mastery. In the context of supportive caregiving relationships, children usually can learn to cope successfully with such experiences. *Id.* The Council defined "tolerable stress" as responses that are somewhat more challenging for a child's neurobiological system. *Id.* The types of events that may present risks to brain

"the presence of supportive adults who create safe environments that help children learn to cope with and recover from major adverse experiences" can make highly threatening and challenging life experiences more tolerable for children, serving as a "buffer" between the child and the most damaging potential effects of the stressors.[123] Consistent with this theme, Ross Thompson—in his companion piece in this Symposium issue—cites the recent American Academy of Pediatrics' policy statement, which defines "toxic stress" as "the excessive or prolonged activation of the physiologic stress response systems in the absence of the buffering protection afforded by stable, responsive relationships."[124]

In the last several decades, research has revealed that severe and chronic stress is associated with a range of neurobiological findings.[125] These findings, in turn, help us understand why those who experience such stress manifest higher rates of psychological disorder and physical illness.[126] Bruce McEwen points out "an inherent paradox" related to an organism's response to stress: The body's responses to stress, particularly activation of the autonomic nervous system and adrenocortical system, are adaptive in the short-term but damaging in the long run if there continue to be adverse experiences with which the organism must cope.[127] McEwen developed the concept of "allostatic load" to describe the types of dysfunction that can occur when we are subjected to repetitive or severe levels of stress.[128] Allostatic load

> refers to the price the body pays for being forced to adapt to adverse psychosocial or physical situations, and it represents either the presence of too much stress or the inefficient operation of the stress

development may include the death or serious illness of a close family member or parental separation or divorce. Yet, in the context of safe and supportive caregiving, potentially harmful neurotoxic effects may be avoided or reversed, as the child learns to cope with, and recovers from, these experiences. *Id.* Finally, the Council defined "toxic stress" as "strong, frequent or prolonged activation of the body's stress management system." Chronic child abuse or exposure to domestic violence, or other "stressful events that are likewise chronic, uncontrollable, and/or experienced without the child having access to support from caring adults tend to provoke these types of toxic stress responses." *Id.* These experiences can have highly adverse effects on brain development and functioning. *Id.*

123. *Id.*

124. Ross A. Thompson, *Bridging Developmental Neuroscience and the Law: Child-Caregiver Relationships*, 63 HASTINGS L.J. 1443, 1454 (citing AAP, *Policy Statement*, *supra* note 120, at e224–31).

125. *See, e.g.*, J. Douglas Bremner, *Stress and Brain Atrophy*, 5 CNS & NEUROLOGICAL DISORDER—DRUG TARGETS 503, 503–12 (2006).

126. *See generally* Bruce S. McEwen & Robert M. Sapolsky, *Stress and Cognitive Function*, 5 CURRENT OPINION NEUROBIOLOGY 205 (1995); Robert M. Sapolsky, *Glucocorticoids, Hippocampal Damage and the Glutamatergic Synapse*, 86 PROGRESS BRAIN RES. 13 (1990); Robert M. Sapolsky, *The Physiological Relevance of Glucocorticoid Endangerment of the Hippocampus*, 746 ANNALS N.Y. ACAD. SCI. 294 (1994); Robert Sapolsky, *Why Stress Is Bad for Your Brain*, 273 SCIENCE 749 (1996).

127. Bruce S. McEwen, *Allostasis and Allostatic Load: Implications for Neuropsychopharmacology*, 22 NEUROPSYCHOPHARMACOLOGY 108, 109 (2000).

128. *Id.*

> hormone response system, which must be turned on and then turned off again after the stressful situation is over.[129]

McEwen elaborated on this in an earlier piece:

> In contrast to homeostatic systems such as blood oxygen, blood pH, and body temperature, which must be maintained [at a relatively steady state] within narrow ranges, allostatic (adaptive) systems have much broader boundaries. Allostatic systems enable us to respond to our physical states (e.g., awake, asleep, supine, standing, exercising) and to cope with noise, crowding, isolation, hunger, extremes of temperature, danger, and microbial or parasitic infection.
>
> The core of the body's response to a challenge—whether it is a dangerous situation, an infection, living in a crowded and unpleasant neighborhood, or a public-speaking test—is twofold, turning on an allostatic response that initiates a complex adaptive pathway, and then shutting off this response when the threat is past.[130]

"The most common allostatic responses involve the sympathetic nervous systems and the HPA axis."[131] Megan Gunnar and colleagues explain:

> The stress response system involves the *sympathetic nervous system*, the various neurotransmitter systems, the immune system, and the *hypothalamic-pituitary adrenocortical (HPA) axis*. The HPA axis maintains the organism's capacity to respond to [stressors,] as the brain is a major organ targeted by steroid hormones produced by this system. In response to a stressor, the HPA axis becomes activated and the hypothalamus and other brain regions release *corticotropin-releasing hormone (CRH)*.
>
> CRH produced in the *amygdala*, a structure involved in orchestrating emotional responses, activates behavioral stress responses such as *fight/flight responses*, heightened vigilance, and defense-related learning and memory. CRH produced in the *hypothalamus*, a structure involved in maintaining *homeostasis*, stimulates production of *adrenocorticotropin hormone (ACTH)* by the *pituitary gland*, which then signals the cortex of the *adrenal glands* to produce and release *cortisol*.... Cortisol facilitates adaptation and restores homeostasis through changing internal dynamics.[132]

McEwen elaborates:

> Inactivation returns the systems to base-line levels of cortisol and catecholamine secretion, which normally happens when the danger [to the individual] is past.... However, if the inactivation is inefficient... there is overexposure to stress hormones. Over weeks, months, or years,

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129. *Id.* at 110–11.

130. Bruce S. McEwen, *Protective and Damaging Effects of Stress Mediators*, 338 NEW ENG. J. MED. 171, 172 (1998).

131. *Id.*

132. MEGAN R. GUNNAR ET AL., STRESS AND EARLY BRAIN DEVELOPMENT 2 (2009). For a more in-depth analysis, see generally Megan R. Gunnar & Delia Vazquez, *Stress Neurobiology and Developmental Psychopathology*, *in* 2 DEVELOPMENTAL PSYCHOPATHOLOGY (DEVELOPMENTAL NEUROSCIENCE) 533 (Dante Cicchetti & Donald J. Cohen eds., 2d ed. 2006).

> exposure to increased secretion of stress hormones can result in allostatic load and its pathophysiologic consequences.[133]

Researchers assert that "overactivity of the HPA axis together with overactivity of the excitatory amino acid neurotransmitters promotes a form of allostatic load, consisting of cognitive dysfunction by a variety of mechanisms that involve reduced neuronal excitability, neuronal atrophy, and, in extreme cases, death of brain cells, particularly in the hippocampus."[134]

Some investigations of the damaging effects of stress on the brain have examined the neurobiology of "traumatic stress" pursuant to the American Psychiatric Association's Diagnostic and Statistical Manual's ("DSM") definition of posttraumatic stress disorder.[135] These studies have identified "lasting effects on brain circuits and systems" involving "a network of brain regions . . . including hippocampus, amygdala, cingulate, and prefrontal cortex."[136] Not all individuals experiencing traumatic stress will meet all of the criteria of the DSM.[137] Indeed, Stanford physician

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133. McEwen, *supra* note 130, at 172.

134. Bruce McEwen & Teresa Seeman, *Allostatic Load and Allostasis*, MACARTHUR RES. NETWORK ON SES & HEALTH, http://www.macses.ucsf.edu/research/allostatic/allostatic.php (last visited July 1, 2012). Shonkoff et al., in writing for the American Academy of Pediatrics Committee, articulate the process as follows:

> Whereas transient increases in these stress hormones are protective and even essential for survival, excessively high levels or prolonged exposures can be quite harmful or frankly toxic, and the dysregulation of this network of physiologic mediators (e.g., too much or too little cortisol; too much or too little inflammatory response) can lead to a chronic "wear and tear" effect on multiple organ systems, including the brain. This cumulative, stress-induced burden on overall body functioning and the aggregated costs, both physiologic and psychological, required for coping and returning to homeostatic balance, have been referred to as "allostatic load." The dynamics of these stress-mediating systems are such that their overactivation in the context of repeated or chronic adversity leads to alterations in their regulation.

Shonkoff et al., *Technical Report*, *supra* note 120, at e235.

135. AM. PSYCHIATRIC ASS'N, DIAGNOSTIC AND STAT. MANUAL-IV-TR 467–68 (4th ed. 2000). Diagnostic criteria for Posttraumatic Stress Disorder (309.81) include: (1) exposure to a traumatic event involving "actual or threatened death or serious injury, or a threat to the physical integrity of self or others," (2) a response of "intense fear, helplessness, or horror," or in children, expression "instead by disorganized or agitated behavior," with subsequent experience of a specified number of symptoms in each of several categories, including persistent re-experiencing of the traumatic event, persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness, persistent symptoms of increased arousal (for example, difficulty falling or staying asleep, irritability, or outbursts of anger), duration of more than one month, and clinical significant distress or impairment in social, cognitive, or other area of functioning. *Id.*

136. Bremner, *supra* note 125, at 504.

137. Lieberman and Amaya-Jackson suggest that the DSM criteria may not adequately reflect the traumatic nature of certain experiences to children. Alicia F. Lieberman & Lisa Amaya-Jackson, *Reciprocal Influences of Attachment and Trauma: Using a Dual Lens in the Assessment and Treatment of Infants, Toddlers, and Preschoolers*, *in* ENHANCING EARLY ATTACHMENTS: THEORY, RESEARCH, INTERVENTION, AND POLICY 100, 102 (Lisa J. Berlin et al. eds., 2005). They note that the DSM definition emphasizes that the individual must experience a threat to the physical welfare or integrity of oneself or another. For children, they point out that certain psychological threats, such as prolonged

Victor Carrion and colleagues have observed that even where children or adolescents do not satisfy the DSM criteria for PTSD, their experience of posttraumatic stress symptoms still places them at risk for many of the detrimental neurobiological effects that may accompany the disorder.[138]

The research literature has not explicitly addressed the relationship between concepts of "toxic stress" and "traumatic stress." Indeed, imprecision frequently characterizes the use of terms like "stress," "trauma," and "traumatic stress."[139] An examination of the definitions of "toxic stress" and "traumatic stress" suggests some overlap. For example, researchers characterize "trauma" as an insult or assault to a person's physical or psychological well-being that "*overwhelms* or *exceeds*" the organism's ability to defend or protect itself from that stressor.[140] Other researchers highlight the theme that stress "becomes traumatic" when the individual's natural response systems can no longer protect the individual from the stressor's potentially damaging effects, resulting in injury to, or the development of pathology in, the individual.[141] These formulations clearly invoke some of the same phenomena incorporated in the definitions of toxic stress.[142] Yet, while the notion of toxic stress recognizes the *potential* for physiological or psychological damage to the individual, concepts of traumatic stress incorporate a requirement that some form of pathology *has resulted* (for example, psychological or physiological symptoms, disorder, or disease process), and in turn informs the question of whether the stress was indeed traumatic for that individual.[143] In the absence of uniform terminology, however, my use of the terms toxic versus traumatic stress in this Article reflects their uses in the sources cited, rather than my imposition of a particular conceptual framework.

B. The Interaction of Toxic Stressors and Developmental Processes

Exposures to toxic stress or traumatic stress can occur at any age. Thus, a question of particular importance for clinical and policy

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separation from one's primary attachment figure, can be sufficiently traumatic to satisfy this diagnostic criterion for a diagnosis of PTSD. *Id.*

138. Victor Carrion et al., *Posttraumatic Stress Symptoms and Brain Function During a Response-Inhibition Task: An fMRI Study in Youth*, 25 DEPRESSION & ANXIETY 514, 516 (2008).

139. Arieh Y. Shalev, *Stress Versus Traumatic Stress: From Acute Homeostatic Reactions to Chronic Psychopathology*, *in* TRAUMATIC STRESS: THE EFFECTS OF OVERWHELMING EXPERIENCE ON MIND, BODY, AND SOCIETY 77, 92–94 (Bessel A. van der Kolk et al. eds., 1996).

140. Karestan C. Koenen et al., *The Epidemiology of Early Childhood Trauma*, *in* THE IMPACT OF EARLY LIFE TRAUMA ON HEALTH AND DISEASE: THE HIDDEN EPIDEMIC 13, 13 (Ruth A. Lanius et al. eds., 2010) (emphasis added).

141. Shalev, *supra* note 139, at 92–93.

142. *See supra* notes 120–134 and accompanying text.

143. Shalev, *supra* note 139, at 94.

interventions affecting children is whether there exists a differential impact on individuals from *early* exposures, as contrasted with exposures later in life. Current research and theory strongly indicate that early adverse experiences interfere more dramatically with normal functioning than do later exposures.[144] Early developmental processes lay the groundwork for future health and well-being: "The foundations of brain architecture are established early in life through a continuous series of dynamic interactions in which environmental conditions and personal experiences have a significant impact on how genetic predispositions are expressed."[145] The human brain, although just one of many organs in our bodies, plays a central role in controlling the other organs and systems.[146] "It interprets and regulates behavioral, neuroendocrine, autonomic, and immunological responses to adverse events, serves as a target of acute and chronic psychosocial and physical stress, and changes both structurally and functionally as a result of significant adversity."[147] Early disruptions in normal neurodevelopmental processes can have substantial effects on the organism's well-being.

In prior decades, discussions about the contributions of environment and genetics to a child's development were framed as debates between competing schools of thought. More recently, however, scientists have begun to examine the highly complex interaction among factors previously characterized as "nature" or "nurture."[148] We now know that life experiences can affect the expression of genes[149] and that genetically influenced behaviors lead individuals (both passively and actively) to modify and select their environments, thereby affecting the nature and type of future experiences.[150] Not only do our brains affect our manner of interacting with and experiencing the world, but our experiences in turn

144. Nat'l Scientific Council on the Developing Child, *The Timing and Quality of Early Experiences Combine to Shape Brain Architecture* 2–3 (Harvard Univ. Ctr. on the Developing Brain, Working Paper No. 5, 2007), *available at* http://developingchild.harvard.edu/resources/reports_and_working_papers [hereinafter *The Timing and Quality of Early Experiences*].

145. *Id.*

146. Jack P. Shonkoff et al., *Neuroscience, Molecular Biology, and the Childhood Roots of Health Disparities: Building a New Framework for Health Promotion and Disease Prevention*, 301 JAMA 2252, 2254 (2009).

147. *Id.*

148. *See, e.g.*, W. Andrew Collins et al., *Contemporary Research on Parenting: The Case for Nature and Nurture*, 55 AM. PSYCHOLOGIST 218 (2000).

149. Nat'l Scientific Council on the Developing Child, *Early Experiences Can Alter Gene Expression and Affect Long-Term Development* 1 (Harvard Univ. Ctr. on the Developing Brain, Working Paper No. 10, 2010), *available at* http://developingchild.harvard.edu/resources/reports_and_working_papers.

150. Lisabeth F. DiLalla, *Behavioral Genetics: Background, Current Research, and Goals for the Future*, *in* BEHAVIOR GENETICS PRINCIPLES: PERSPECTIVES IN DEVELOPMENT, PERSONALITY, AND PSYCHOPATHOLOGY 3, 9–10 (Lisabeth DiLalla ed., 2004).

affect the structure and function of our brains.[151] As neurobiologist Regina Sullivan states in her companion piece in this issue:

> [E]arly life experiences can dramatically alter the number of specialized communication cells within the brain (neurons), and these experiences can then increase or decrease the complexity of the neurons (dendritic branches) and the number of communication sites between them (synapses). The effects of this experience-based sculpting on the brain have profound effects on how the brain functions. In particular, they can determine how emotional centers of the brain communicate with the cortex and its higher functioning to detemine our personality, our choices, and how we approach the world.[152]

There is still much that we do not know about the plasticity of the brain (that is, the flexibility of the brain to continue to change and develop) throughout the lifespan. In recent years, we have learned that the brain is far more malleable than previously imagined, including during adulthood.[153] However, the timing of experiences is not irrelevant. The brain's adaptive capacities decline with maturity: "Thus, building more advanced cognitive, social, and emotional skills on a weak initial foundation of brain architecture is far more difficult and less effective than getting things right from the beginning."[154]

McEwen observes that "early life experiences play a powerful role in determining allostatic load over a lifetime," and "the susceptibility of an individual to allostatic load is likely to reflect developmental influences as well as genetic risk factors."[155] Other researchers emphasize the interrelationship of the timing and effects of stressors.[156] They

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151. CTR. ON THE DEVELOPING CHILD, A SCIENCE-BASED FRAMEWORK FOR EARLY CHILDHOOD POLICY: USING EVIDENCE TO IMPROVE OUTCOMES IN LEARNING, BEHAVIOR, AND HEALTH FOR VULNERABLE CHILDREN (2007); NAT'L RES. COUNCIL & INST. OF MED., FROM NEURONS TO NEIGHBORHOODS: THE SCIENCE OF EARLY CHILD DEVELOPMENT 182–217 (Jack P. Shonkoff & Deborah A. Phillips eds., 2000) [hereinafter FROM NEURONS TO NEIGHBORHOODS].

152. Sullivan, *supra* note 107, at 1554.

153. PETER R. HUTTENLOCHER, NEURAL PLASTICITY: THE EFFECTS OF ENVIRONMENT ON THE DEVELOPMENT OF THE CEREBRAL CORTEX 189 (2002).

154. *The Timing and Quality of Early Experiences*, *supra* note 144, at 1 (citation omitted).

155. McEwen, *supra* note 127, at 115; *see also* Bruce S. McEwen, *Understanding the Potency of Stressful Early Life Experiences on Brain and Body Function*, 57 METABOLISM CLINICAL & EXPERIMENTAL S11, S11 (2008).

156. *See generally* Sonia J. Lupien et al., *Effects of Stress Throughout the Lifespan on the Brain, Behavior and Cognition*, 10 NATURE NEUROSCI. REV. 434 (2009); *see also* Sonia J. Lupien et al., *Beyond the Stress Concept: Allostatic Load—A Developmental and Cognitive Perspective*, *in* 2 DEVELOPMENTAL PSYCHOPATHOLOGY (DEVELOPMENTAL NEUROSCIENCE) 578 (Dante Cicchetti & Donald J. Cohen eds., 2d ed. 2006). Some have characterized the process the developing brain undergoes in response to these stressors as leading to "alternate pathway[s] of neurodevelopment." Carryl P. Navalta et al., *Trajectories of Neurobehavioral Development: The Clinical Neuroscience of Child Abuse*, *in* STRESS, TRAUMA, AND CHILDREN'S MEMORY DEVELOPMENT: NEUROBIOLOGICAL, COGNITIVE, CLINICAL, AND LEGAL PERSPECTIVES 50, 57 (Mark L. Howe et al. eds., 2008); *see also* Catherine C. Ayoub & Gabrielle Rappolt-Schlichtmann, *Child Maltreatment and the Development of Alternate Pathways in Biology and Behavior*, *in* HUMAN BEHAVIOR, LEARNING, AND THE DEVELOPING BRAIN: ATYPICAL DEVELOPMENT 305,

indicate that the chronic or repeated exposure to stress has its "highest impact on those structures that are developing at the time of the stress exposure (in young individuals)" with "early windows of vulnerability (or sensitive periods) during which specific regions of the brain are most susceptible to environmental influences, through a neurotoxicity process."[157] In sum, while we continue to learn more about the brain's capacity to change throughout the lifespan, there is substantial agreement among developmental neurobiologists that early experiences have a profound, and disproportionately salient, impact on an individual's future functioning. Indeed, as Part III.C reveals, exposure to certain types of highly-aversive experiences in early childhood, such as child maltreatment, places individuals at risk for the development of a range of serious biochemical, neuroanatomical, and functional abnormalities that have the potential to significantly and deleteriously impact their health and well-being.[158]

C. SOME FINDINGS ON THE NEUROBIOLOGY OF CHILD MALTREATMENT AND OF EARLY LIFE TRAUMATIC EXPERIENCES

The summary provided here touches briefly on some of the findings of research with human participants[159] on the effects of child maltreatment and other early life traumatic experiences.[160] Some of these studies have

323 (Donna Coch et al. eds., 2007). In other words, when the brain is going through one or more of its sensitive periods in development during postnatal life, the exposure to high levels of stress hormones as a result of child maltreatment leads the organism to adapt to the circumstances in which it must function, altering the developmental trajectory and affecting brain systems differentially, depending on the particular experiences. Navalta et al., *supra*, at 57. Although this theorized selection of an alternate pathway is an adaptation to the stressful life experiences with which the individual must cope, "this adaptation comes at a high price. The same developmental pathway that allows for survival in a malevolent world" creates a higher risk of serious health and mental health problems, and does not facilitate adaptation "when the affected individuals find themselves in a more benign environment." Ayoub & Rappolt-Schlichtmann, *supra*, at 323; *see also* Thompson, *supra* note 124.

157. Lupien, *supra* note 156, at 440–41. Richard Bryck and Philip Fisher highlight the first two years of life as a period deserving particular attention because of the dramatic developmental changes that occur during this early life stage. Richard L. Bryck & Philip A. Fisher, *Training the Brain: Practical Applications of Neural Plasticity from the Intersection of Cognitive Neuroscience, Developmental Psychology, and Prevention Science*, 67 AM. PSYCHOLOGIST 87, 89 (2012).

158. *See infra* Part C.

159. Studies examining the neurobiological effects of child maltreatment or other adverse childhood experiences have differed in the sampling criteria they have used. Some studies focus solely on studying the effects of *child maltreatment* as the relevant early life event, while others have included a wider range of adverse childhood experiences in addition to child maltreatment. Some studies focus solely on subjects who meet dual criteria of having been maltreated *and* exhibiting clinical symptoms of posttraumatic stress, while other studies do not impose these dual requirements. Some studies distinguish among types of maltreatment in their design. Given that early studies suggest that the subtypes of maltreatment may affect the brain in different ways, greater attention to the nature of the maltreatment may provide useful information.

160. Much of the important research on the effects of maltreatment and stress on the brain and the neurobiology of attachment has been conducted with animals. The findings of such work have

examined neurochemical factors, while others have looked at structural or functional alterations through imaging of brain structures.

Part III.A describes some of the responses of our brain to stress, such as the release of the "stress hormones" and the dangers to an individual from chronic exposure to severe stress, especially in the absence of countervailing "protective" factors.[161] Logically, therefore, one of the targets of empirical investigation in exploring the impact of child maltreatment on the brain has been the functioning of the neuroendocrine systems. Measurement of cortisol levels plays an important role in this line of research: "Cortisol is a hormone that is produced by one of the body's major stress regulatory systems: the hypothalamic-pituitary-adrenocortical (HPA) axis," and its production is the end step in a several stage physiological response to stress.[162] "The production of cortisol normally follows a circadian rhythm, with levels being high in the morning and declining during the course of the day. During stress, the HPA axis starts to increase the production of cortisol . . . ."[163] Alterations in these typical patterns may be observed if the individual experiences sustained exposures to significant stressors which affect the production of cortisol. Because cortisol levels can be measured from samples of saliva, the collection process is "simple, painless, [and] non-invasive," an advantage in carrying out research measuring cortisol levels with child participants.[164]

Neuroendocrinological studies reveal that children who have experienced maltreatment may manifest abnormal patterns of cortisol regulation, suggesting dysregulation of the HPA system.[165] Depending

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permitted experimental testing that would not be morally permissible or practically feasible with humans. *See generall*, Sullivan, *supra* note 107; *see, e.g.*, Martin H. Teicher et al., *Neurobiological Consequences of Early Stress and Childhood Maltreatment: Are Results from Human and Animal Studies Comparable?*, 1071 ANNALS N.Y. ACAD. SCI. 313, 313 (2006); *see also* Eamon McCrory et al., *The Impact of Childhood Maltreatment: A Review of Neurobiological and Genetic Factors*, 2 FRONTIERS PSYCHIATRY 1 (2011) (summarizing research findings, illustrating how animal models provide the foundation for studies with humans).

161. *See supra* notes 121–143 and accompanying text.

162. Lenneke R.A. Alink et al., *Longitudinal Associations Among Child Maltreatment, Social Functioning, and Cortisol Regulation*, 48 DEVELOPMENTAL PSYCHOL. 224, 224 (2012). "As a first step, the hypothalamus releases corticotrophin-releasing hormone (CRH), which triggers the release of adrenocotropic hormone (ACTH) by the pituitary gland and as a result of that, the adrenal cortex releases [cortisol as well as other hormones called corticosteroids]." *Id.*

163. *Id.* at 224–25 (citation omitted).

164. Brian A. Kalman & Ruth E. Grahn, *Measuring Salivary Cortisol in the Behavioral Neuroscience Laboratory*, 2 J. UNDERGRADUATE NEUROSCI. EDUC. A41, A41 (2004). Cortisol levels can also be measured in urine or blood. Ari Levine et al., *Measuring Cortisol in Human Psychobiological Studies*, 90 PHYSIOLOGY & BEHAV. 43 (2007).

165. *See, e.g.*, Alink et al., *supra* note 162; Victor G. Carrion et al., *Diurnal Salivary Cortisol in Pediatric Posttraumatic Stress Disorder*, 51 BIOLOGICAL PSYCHIATRY 575 (2002); Dante Cicchetti & Fred A. Rogosch, *Diverse Patterns of Neuroendocrine Activity in Maltreated Children*, 13 DEV. & PSYCHOPATHOLOGY 677 (2001); Dante Cicchetti, *Neuroendocrine Functioning in Maltreated Children*, *in* NEURODEVELOPMENTAL MECHANISMS IN PSYCHOPATHOLOGY 345, 349–56 (Dante Cicchetti & Elaine F.

upon particular variables—which may include the subtype, timing, and severity of the maltreatment—and whether the child displays particular patterns of clinical symptoms of posttraumatic stress or other disorders, dysregulation may manifest differently (for example, as elevated versus depressed cortisol levels, or as varied patterns of elevation or depression at particular times within the twenty-four-hour daily cycle). This indicates that the experience of maltreatment may lead to any of a range of neurological abnormalities—a phenomenon that researchers have only just begun to explore.[166] For example, some studies have found that children who have experienced both physical and sexual abuse may exhibit higher than normal levels of cortisol, whereas children who have been physically but not sexually abused may exhibit lower than normal levels of cortisol.[167] Other factors may relate to differences among maltreated children in measured cortisol levels. Consistent with the discussion about the interaction of toxic stress and human development in Part III.B, the *timing* of exposures to high levels of stress may contribute to the effects as well. For example, a "life cycle model of stress" that emphasizes how the experience of particular types of stressors at particular stages of children's development may differentially lead to increased versus decreased secretion of cortisol.[168] A study by Carl Weems and Victor Carrion suggests that another important variable in the interpretation of results is the time since the experience of trauma.[169]

Both high and low levels of cortisol are cause for concern. While our bodies' "capacity to elevate the stress hormone cortisol in response to acute trauma is critical for survival," and brief "elevations in corticosteroids following acute stressors appear to enhance the individual's ability to manage stressful experiences competently," chronic hyperactivity or hypoactivity of the HPA axis (that is, hypercortisolism or hypocortisolism, respectively) can lead to a range of deleterious consequences for brain development and function.[170] Indeed, researchers

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Walker eds., 2003); Michael D. De Bellis & Lisa A. Thomas, *Biologic Findings of Post-Traumatic Stress Disorder and Child Maltreatment*, 5 CURRENT PSYCHIATRY REP. 108, 110 (2003); Michael D. De Bellis et al., *Developmental Traumatology Part I: Biological Stress Systems*, 45 BIOLOGICAL PSYCHIATRY 1259 (1999).

166. Cicchetti & Rogosch, *supra* note 165; Cicchetti, *supra* note 165, at 356.

167. Cicchetti & Rogosch, *supra* note 165.

168. *See generally* Sonia J. Lupien et al., *Effects of Stress Throughout the Lifespan on the Brain, Behavior and Cognition*, 10 NATURE NEUROSCI. REV. 434, 440 (2009).

169. *See generally* Carl F. Weems & Victor G. Carrion, *The Association Between PTS Symptoms and Salivary Cortisol in Youth: The Role of Time Since the Trauma*, 20 J. TRAUMATIC STRESS 903 (2007).

170. Cicchetti & Toth, *supra* note 93, at 424. These effects of hypercortisolism may include "accelerated loss or metabolism of hippocampal neurons, the inhibition of neurogenesis, lags in the development of myelination, abnormalities in synaptic pruning, and impaired affective and cognitive ability." *Id.* (citation omitted). Hypocortisolism may lead to "reduced adrenocortical secretion, reduced adrenocortical reactivity, or enhanced negative feedback inhibition of the HPA axis,"

are increasingly linking cortisol dysregulation to the manifestation of cognitive, behavioral, and health problems.[171] Furthermore, studies suggest that the atypical responsiveness of the HPA axis to the stress that follows from early trauma appears to create physiological and psychological vulnerabilities that predispose individuals to the development of health and mental health disorders in later life.[172]

Brain-imaging studies have examined differences in brain structure between control groups and groups that have suffered early maltreatment or other adversity. De Bellis found that children who had experienced maltreatment and exhibited PTSD symptomatology had smaller brains than did individuals in the control group,[173] a finding replicated by Carrion in his study of youth who had experienced early life trauma.[174] De Bellis found atrophy most apparent in the corpus callosum, a structure that connects the two hemispheres of the brain, promoting communication and coordination and controlling some aspects of arousal, emotion, and some higher cognitive abilities.[175] The earlier the onset of abuse and the longer its duration, the more severe the reduction in cranial volume.[176] De Bellis and Thomas indicate that the findings of reduced cerebral volume "may implicate neuronal loss, disruption of neuronal growth, or interference with neuronal replacement and migration."[177] De Bellis and Thomas posit that the observed abnormalities of brain development may be causally related to the "cognitive and developmental

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damaging neurons and contributing "to the development of stress-related bodily disorders." *Id.* at 424–25 (citation omitted).

171. *See, e.g.*, Alink et al., *supra* note 162, at 225–26.

172. Megan R. Gunnar, Philip A. Fisher & The Early Experience, Stress, and Prevention Network, *Bringing Basic Research on Early Experience and Stress Neurobiology to Bear on Preventive Interventions for Neglected and Maltreated Children*, 18 DEV. & PSYCHOPATHOLOGY 651 (2006); McCrory et al., *supra* note 160, at 2. Although dysregulation of the HPA axis and production of cortisol have received more attention in the scholarly literature than have other biochemical responses of the brain to maltreatment or other forms of severe or chronic stress, some scholars have studied or hypothesized the roles of other associated chemical changes. *See, e.g.*, De Bellis et al., *Biological Stress Systems*, *supra* note 165, at 1265–68 (finding that children who had experienced abuse and were diagnosed with PTSD manifested abnormalities in levels of certain neurotransmitters); Heim et al., *supra* note 94, at 675–76; Bruce S. McEwen, *The Neurobiology of Stress: From Serendipity to Clinical Relevance*, 886 BRAIN RES. 172, 176–77 (2000) (discussing the role of neurotransmitters such as glutamate, gamma-aminobutyric acid, and serotonin).

173. De Bellis & Thomas, *supra* note 165, at 112; Michael D. De Bellis et al., *Developmental Traumatology Part II: Brain Development*, 45 BIOLOGICAL PSYCHIATRY 1271 (1999) [hereinafter De Bellis et al., *Brain Development*].

174. Victor G. Carrion et al., *Attenuation of Frontal Asymmetry in Pediatric Posttraumatic Stress Disorder*, 50 BIOLOGICAL PSYCHIATRY 943, 943 (2001).

175. De Bellis & Thomas, *supra* note 165, at 112; De Bellis et al., *Brain Development*, *supra* note 173; McCrory et al., *supra* note 160, at 3; *see also* Martin H. Teicher et al., *Childhood Neglect Is Associated with Reduced Corpus Callosum Area*, 56 BIOLOGICAL PSYCHIATRY 80 (2004) (also finding reduced corpus callosum volume).

176. De Bellis & Thomas, *supra* note 165, at 112.

177. *Id.*

deficits, as well as pervasive emotional and behavioral problems, which many maltreated children with PTSD symptoms express."[178]

The hippocampus is a brain region that plays an important role in memory.[179] It appears to be particularly vulnerable to stressful experiences.[180] The "hippocampus has a long postnatal developmental period and a high density of glucocorticoid receptors, making it vulnerable to cortisol neurotoxicity" under conditions of severe stress.[181] Animal studies provided the initial evidence that exposure to severe stress not only impairs memory function, but also causes damage to the hippocampus.[182] Studies have revealed reduced left hippocampal volume in adults with a childhood history of trauma and current symptoms of PTSD or other psychopathology, yet most studies of maltreated children have not found such reductions.[183] Scientists have speculated that these findings, taken together, might reveal a developmental trend—with damage to the hippocampus beginning in childhood, but not manifesting as

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178. *Id.*

179. The hippocampus "is thought to record in memory the spatial and temporal dimensions of experience. It plays an important role in the categorization and storage of incoming stimuli in memory. The hippocampus is especially vital to short-term memory—the holding in mind of a piece of information for a few moments, after which it either comes to reside in more permanent memory or is immediately forgotten." Bessel A. van der Kolk, *The Body Keeps the Score: Approaches to the Psychobiology of Posttraumatic Stress Disorder*, *in* TRAUMATIC STRESS: THE EFFECTS OF OVERWHELMING EXPERIENCE ON MIND, BODY, AND SOCIETY 214, 231 (Bessel A. van der Kolk et al. eds., 2007). Those who have experienced traumatic events often manifest memory disturbances, consistent with observations of hippocampal abnormalities in persons with posttraumatic stress symptoms. Jasmeet Pannu Hayes et al., *Reduced Hippocampal and Amygdala Activity Predicts Memory Distortions for Trauma Reminders in Combat-Related PTSD*, 45 J. PSYCHIATRIC RES. 660, 660 (2011).

> Posttraumatic stress disorder (PTSD) has been characterized as a disorder of memory, with key features including intrusive memories of the traumatic event, flashbacks, and nightmares. While the re-experiencing symptoms of traumatic events are often difficult to inhibit, PTSD is paradoxically related to abnormal access to trauma memories and difficulty remembering certain aspects of the trauma.

Id.

180. Ayoub & Rappolt-Schlichtmann, *supra* note 156, at 310; J. Douglas Bremner, *Does Stress Damage the Brain?*, *in* UNDERSTANDING TRAUMA: INTEGRATING BIOLOGICAL, CLINICAL, AND CULTURAL PERSPECTIVES 118, 119 (Laurence J. Kirmayer et al. eds., 2007).

181. Ayoub & Rappolt-Schlichtmann, *supra* note 156, at 310–11.

182. *See, e.g.*, Bremner, *supra* note 180, at 119; Robert M. Sapolsky et al., *Hippocampal Damage Associated with Prolonged Glucocorticoid Exposure in Primates*, 10 J. NEUROSCI. 2897 (1990); Robert M. Sapolsky et al., *Prolonged Glucocorticoid Exposure Reduces Hippocampal Neuron Number: Implications for Aging*, 3 J. NEUROSCI. 1222 (1985).

183. *See* Carrion et al., *supra* note 174; Udo Dannlowski et al., *Limbic Scars: Long-Term Consequences of Childhood Maltreatment Revealed by Functional and Structural Magnetic Resonance Imaging*, 71 BIOLOGICAL PSYCHIATRY 286 (2012) (finding hippocampal atrophy in adults with history of child maltreatment); De Bellis et al., *Brain Development*, *supra* note 173; Martin H. Teicher et al., *Child Maltreatment Is Associated with Reduced Volume in the Hippocampal Subfields CA3, Dentate Gyrus and Subiculum*, PNAS 5 (2012).

a change in hippocampal volume until adulthood—if the adverse life experiences are sufficiently severe and prolonged in the intervening years.[184]

A series of studies by Carrion and colleagues support the hypothesis that the toxic stress experienced by children who encounter traumatic life events has an impact on the hippocampus, despite the failure to find evidence of such brain damage in child subjects.[185] Using functional magnetic resonance imaging technology,[186] Carrion's team observed lower levels of hippocampal activation in a group of children who demonstrated posttraumatic stress symptoms than in a control group.[187] Thus, even though *structural* changes in the hippocampus prior to adulthood have been difficult to discern using current scanning techniques, this study observed abnormal patterns of hippocampal *functioning* in children.[188] Another study by Carrion and colleagues sheds additional light on the particular mechanisms and chronology of hippocampal changes in children, relative to the experience of traumatic stressors.[189] The investigators found that the severity of PTSD symptoms and measured levels of cortisol in youths aged seven to thirteen years old predicted reductions in hippocampal volumes observed twelve to eighteen months later.[190] This investigation, although a pilot study involving a small sample of fifteen children, supports the theory that abnormalities in cortisol secretion in children who experience early adversity and exhibit posttraumatic stress symptoms may lead to subsequent hippocampal damage.[191] The researchers posit three factors that may to relate to the nature and degree of the "neurotoxic effects of cortisol on the hippocampus": (1) the developmental stage of the structure (the hippocampus glucocorticoid receptors density may change throughout development), (2) the level and sustainability of cortisol released, and (3) the severity and/or chronicity of the stressful events.[192] Although

184. Ayoub & Rappolt-Schlichtmann, *supra* note 156, at 311.

185. *See supra* notes 186–192 and accompanying text.

186. "Functional brain mapping with magnetic resonance imaging (MRI) is a [relatively new and] rapidly growing field .... Functional MRI (fMRI) is the use of MRI equipment to detect regional changes cerebral metabolism or in blood flow, volume or oxygenation in response to task activation." DOUGLAS C. NOLL, A PRIMER ON MRI AND FUNCTIONAL MRI (2001). Using these scanners, the researcher can observe the activation of different brain regions when subjects engage in particular tasks, thereby identifying the regions of the brain involved in performing particular functions.

187. Victor G. Carrion et al., *Reduced Hippocampal Activity in Youth with Posttraumatic Stress Symptoms: An fMRI Study*, 35 J. PEDIATRIC PSYCHOL. 559 (2010). Furthermore, patterns of hippocampal activation correlated with the severity of certain posttraumatic stress symptoms. *Id.* That is, the more severe the symptoms, the greater the reduction in hippocampal activation.

188. *Id.*

189. Victor G. Carrion et al., *Stress Predicts Brain Changes in Children: A Pilot Longitudinal Study on Youth Stress, Posttraumatic Stress Disorder, and the Hippocampus*, 119 PEDIATRICS 509, 513 (2007).

190. *Id.*

191. *Id.* at 513–15.

192. *Id.* at 515.

these findings are consistent with those obtained from animal studies and research with adults who experienced traumatic stress in childhood, further research is needed to better understand how this team's findings relate to prior studies with child subjects.[193]

Abnormalities in other brain regions have been found as well, either in adults who have experienced maltreatment as children or in children with such experiences: "The amygdala plays a key role in evaluating potentially threatening information, fear conditioning, emotional processing, and memory for emotional events."[194] Based on animal studies, it was predicted that differences would be found in the structure of the amygdala as a result of child maltreatment.[195] While such findings were not observed in humans initially, studies examining children who had experienced severe deprivation during institutionalization[196] demonstrated increased amygdala volumes in this group as compared with the control group, and a positive relationship between the length of institutionalization and the amygdala volume.[197] Recent research has also revealed differences in amygdala volume in children raised by depressed mothers.[198] Furthermore, differences in amygdala functioning have been found in adults who report experiences of child maltreatment.[199] The amygdala plays a role as the "mediating agent" between environmental stress and the regulation of one's responses to such stress.[200] Research reveals that abnormalities in amygdala functioning may be associated with anxiety and depressive disorders.[201] These conditions, as noted above, are observed with greater prevalence in populations that have experienced

193. *See supra* notes 174–184 and accompanying text.

194. McCrory et al., *supra* note 160, at 3.

195. Mitul A. Mehta et al., *Amygdala, Hippocampal and Corpus Callosum Size Following Severe Early Institutional Deprivation: The English and Romanian Adoptees Study Pilot*, 50 J. CHILD PSYCHOL. & PSYCHIATRY 943 (2009); *see also* Nim Tottenham et al., *Prolonged Institutional Rearing Is Associated with Atypically Larger Amygdala Volume and Difficulties in Emotion Regulation*, 13 DEVELOPMENTAL SCI. 46 (2010) [hereinafter Tottenham et al., *Prolonged Institutional Rearing*]. For a discussion of the role of adversity and developmental factors on changes in the amygdala and hippocampus, see Nim Tottenham & Margaret A. Sheridan, *A Review of Adversity, the Amygdala and the Hippocampus: A Consideration of Developmental Timing*, 3 FRONTIERS HUM. NEUROSCI. 1 (2010).

196. The children in question spent their early years in state orphanages in Romania, living in conditions described by the researchers as "poor to appalling." Mehta et al., *supra* note 195, at 943. "Typically, they remained in cots all day, had few if any toys or playthings, and were fed gruel through bottles with large teats; there was no personalised care-giving and very little talk or interaction with caregivers." *Id.* (citation omitted).

197. *Id.*

198. Sonia J. Lupien et al., *Larger Amygdala but No Change in Hippocampal Volume in 10-Year-Old Children Exposed to Maternal Depressive Symptomatology Since Birth*, 108 PNAS 14324, 14325–26 (2011).

199. *See* Dannlowski et al., *supra* note 183 (finding that, in adult subjects, those who experienced maltreatment as children demonstrated hyperresponsiveness to negative stimuli in the amygdala).

200. Tottenham et al., *Prolonged Institutional Rearing*, *supra* note 195, at 48.

201. *Id.*

early life adversity, as contrasted with the general population.[202] Thus, empirical studies now suggest a possible neurobiological mechanism through which early experiences lead to certain forms of adult psychopathology.

Studies have also found differences in the prefrontal cortex volume of adults who report experiencing maltreatment as children.[203] The prefrontal cortex is involved in a wide range of functions, including executive functionality (for example, planning and controlling behavioral responses, problem-solving, sustaining mental productivity), attention focusing, working and delayed memory, emotional regulation, and responses to stress.[204] Carrion and colleagues found abnormalities in the prefrontal cortices of children who were diagnosed with posttraumatic stress symptoms which correlated with functional impairments measured on behavioral indices[205] and differences in cortisol output.[206] Most recently, Erin Edmiston and colleagues observed differences in several brain regions—including the prefrontal cortex, amygdala, and other areas—in adolescents reporting exposure to emotional maltreatment.[207] Because the prefrontal cortex is theorized to support "a diverse array of mental processes through the activation, maintenance, and inhibition of activity in other structures," a functional abnormality of the prefrontal cortex may explain certain posttraumatic stress symptoms, such as those involving memory, attention, emotional disinhibition, and intrusive memories.[208]

Studies have also revealed differences in other areas of brain chemistry, structure, or functioning between children who have experienced maltreatment or other traumatic stressors and normal controls.[209] Recent studies have explored how particular genetic factors

202. *See supra* notes 92–94 and accompanying text.

203. *See, e.g.*, Anne-Laura van Harmelen et al., *Reduced Medial Prefrontal Cortex Volume in Adults Reporting Childhood Emotional Maltreatment*, 68 BIOLOGICAL PSYCHIATRY 832 (2010).

204. Kathryn R. Wilson et al., *The Traumatic Stress Response in Child Maltreatment and Resultant Neuropsychological Effects*, 16 AGGRESSION & VIOLENT BEHAV. 87, 92 (2011); *see also* Michael D. De Bellis, *The Psychobiology of Neglect*, 10 CHILD MALTREATMENT 150, 151 (2005). Notably, deficits in the skill areas cited in the text have been observed in adults and children diagnosed with PTSD. De Bellis, *supra*, at 160.

205. Katherine A. Richert et al., *Regional Differences of the Prefrontal Cortex in Pediatric PTSD: An MRI Study*, 23 DEPRESSION & ANXIETY 17 (2006).

206. Victor G. Carrion et al., *Decreased Prefrontal Cortical Volume Associated with Increased Bedtime Cortisol in Traumatized Youth*, 68 BIOLOGICAL PSYCHIATRY 491 (2010).

207. Erin E. Edmiston et al., *Corticostriatal-Limbic Gray Matter Morphology in Adolescents with Self-Reported Exposure to Childhood Maltreatment*, 165 ARCHIVES PEDIATRICS & ADOLESCENT MED. 1069 (2011).

208. Richert et al., *supra* note 205, at 18.

209. For example, Yutaka Ito, Martin Teicher, and colleagues have measured abnormalities in brain wave activity in a series of studies evaluating electrophysiological functioning in maltreated children using electroencephalograms. *See* Yutaka Ito et al., *Increased Prevalence of Electrophysiological Abnormalities in Children with Psychological, Physical, and Sexual Abuse*,

interact with experience to mediate the effects of maltreatment on the brain.[210] In particular, studies suggest that certain genetic factors may create predisposing vulnerabilities or strengths that affect the impact of early life adversity on the individual.[211] Furthermore, scientists are examining epigenetic phenomena—that is, the ways in which experiences such as child maltreatment affect the expression of genes.[212]

D. THE PARTICULARIZED IMPACT OF MALTREATMENT BY ONE'S PRIMARY CAREGIVER

One question that the literature has not yet addressed in depth is whether—and if so, how—the neurobiological effects of maltreatment by children's primary caregivers differ from those influenced by exposure to other toxic stressors or adverse childhood experiences. As discussed in Part III.A, exposure to abuse and neglect can be a toxic stressor and can lead to psychopathology, including symptoms of posttraumatic stress, particularly in the absence of stable and sensitive caregiving by someone

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5 J. NEUROPSYCHIATRY & CLINICAL NEUROSCIS. 401 (1993); Yutaka Ito et al., *Preliminary Evidence for Aberrant Cortical Development in Abused Children: A Quantitative EEG Study*, 10 J. NEUROPSYCHIATRY & CLINICAL NEUROSCIS. 298 (1998). For reviews of research on the neurobiology of child maltreatment or other adverse childhood experiences, see Anda et al., *supra* note 94, at 3; Cicchetti & Toth, *supra* note 93, at 423–27; Heim et al., *supra* note 94; McCrory et al., *supra* note 160; Gretchen N. Neigh et al., *The Neurobiological Toll of Child Abuse and Neglect*, 10 TRAUMA, VIOLENCE & ABUSE 389 (2009); Rena Repetti et al., *The Influence of Early Socialization Experiences on the Development of Biological Systems*, *in* HANDBOOK OF SOCIALIZATION THEORY AND RESEARCH 124 (Joan E. Grusec & Paul D. Hastings eds., 2007); Martin H. Teicher et al., *The Neurobiological Consequences of Early Stress and Childhood Maltreatment*, 27 NEUROSCI. & BIOBEHAVIORAL REV. 33 (2003); Sandra Twardosz & John R. Lutzker, *Child Maltreatment and the Developing Brain: A Review of Neuroscience Perspectives*, 15 AGGRESSION & VIOLENT BEHAV. 59 (2010).

210. Dante Cicchetti et al., *Interactions of Child Maltreatment and Serotonin Transporter and Monoamine Oxidase A Polymorphisms: Depressive Symptomatology Among Adolescents from Low Socioeconomic Status Backgrounds*, 19 DEV. & PSYCHOPATHOLOGY 1161 (2007); Colin G. DeYoung et al., *Moderation of the Association Between Childhood Maltreatment and Neuroticism by the Corticotropin-Releasing Hormone Receptor 1 Gene*, 52 J. CHILD PSYCHOL. & PSYCHIATRY 1 (2011); Valentina Nikulina et al., *Child Abuse and Neglect, MAOA, and Mental Health Outcomes: A Prospective Examination*, 71 BIOLOGICAL PSYCHIATRY 350 (2012).

211. *See* Ciccetti et al., *supra* note 210, at 1161; DeYoung et al., *supra* note 210, at 898; Nikulina et al., *supra* note 210, at 350.

212. *See, e.g.*, Tania L. Roth et al., *Lasting Epigenetic Influence of Early-Life Adversity on the* BDNF *Gene*, 65 BIOLOGICAL PSYCHIATRY 760 (2009) (finding that maltreatment early in life of rats can alter gene expression affecting prefrontal cortex). The authors explain:

> Epigenetic modulation of gene transcription, a newly proposed substrate for regulating gene expression changes underlying neural plasticity, might . . . be affected by early-life adversity. . . .
>
> . . . [I]ncreased susceptibility to cognitive impairments and psychiatric illnesses in adults with a history of childhood maltreatment might reflect a lasting imprint of early maltreatment on epigenetic mechanisms regulating gene expression.

Id. at 760; *see also* Frances A. Champagne & James P. Curley, *Epigenetic Mechanisms Mediating the Long-Term Effects of Maternal Care on Development*, 33 NEUROSCI. & BIOBEHAVIORAL REV. 593, 598 (2009).

in the child's life.[213] The cumulative effect of chronic exposure to stressors during childhood creates vulnerabilities, the damaging effects of which may manifest years, or even decades, after exposure.[214] But is maltreatment at the hands of a primary caregiver different from other adverse childhood experiences in its impact on a child's neurobiological development?

Children's relationships with their caregivers play special roles in their lives and development. Indeed, animal research indicates that the attachment to the caregiver operates as a regulator of infant physiology until the child develops mechanisms of self-regulation through interactions with the caregiver.[215] Studies suggest that the regulatory patterns learned in infancy can have a persistent impact on individuals' responses to future experiences.[216] Highly dysfunctional relationships with caregivers may affect neurobiological development in distinct ways because the child is faced not only with the presence of traumatic experiences, but also with the absence of the normal developmental opportunities that occur through healthy parent-child interactions.[217] Indeed, Dante Cicchetti characterizes child maltreatment as "the greatest failure of the environment to provide opportunities for normal development."[218]

While modern developmental science recognizes that children's experiences in their relationships with their parents or alternative primary caregivers are not the only important influence on children's developmental trajectories, the impact of these relationships on children's future functioning is considerable.[219] The developmental construct of "attachment" and the extensive body of research it has spawned provide some initial insights into how children's relationships with their caregivers affect such growth.[220] Attachment theory and research form a critical

213. *See supra* notes 93–142 and accompanying text.

214. *Id.*

215. *See, e.g.*, Myron A. Hofer, *Psychobiological Roots of Early Attachment*, 15 CURRENT DIRECTIONS IN PSYCHOL. SCI. 84, 87 (2006); Myron A. Hofer & Regina M. Sullivan, *Toward a Neurobiology of Attachment*, *in* HANDBOOK OF DEVELOPMENTAL COGNITIVE NEUROSCIENCE 599 (Charles A. Nelson & Monica Luciana eds., 2001); *see also* Allan N. Schore, *Attachment, Affect Regulation, and the Developing Right Brain: Linking Developmental Neuroscience to Pediatrics*, 26 PEDIATRICS REV. 204, 206–08 (2005).

216. SUSAN GOLDBERG, ATTACHMENT AND DEVELOPMENT 189 (2000).

217. *See* Dante Cicchetti, *An Odyssey of Discovery: Lessons Learned Through Three Decades of Research on Child Maltreatment*, 59 AM. PSYCHOL. 731, 734 (2004).

218. *Id.*

219. FROM NEURONS TO NEIGHBORHOODS, *supra* note 151, at 226–28.

220. The best compilation of attachment research can be found in HANDBOOK OF ATTACHMENT: THEORY, RESEARCH, AND CLINICAL APPLICATIONS (Jude Cassidy & Phillip R. Shaver eds., 2d ed. 2008). For a good general review of theory and research, see Jude Cassidy, *The Nature of the Child's Ties*, *in* HANDBOOK OF ATTACHMENT: THEORY, RESEARCH, AND CLINICAL APPLICATIONS 3 (Jude Cassidy & Phillip R. Shaver eds., 2d ed. 2008). For nuanced interpretation of some of the complexities inherent in understanding the effects of early attachment on later functioning, see Ross A. Thompson, *Early Attachment and Later Development: Familiar Questions, New Answers*, *in* HANDBOOK OF ATTACHMENT:

cornerstone of current understandings about the impact of children's relationships with their caregivers.

Humans are one of many species whose young are biologically predisposed to stay close to attachment figures.[221] From the perspective of evolutionary theory, this tendency is highly adaptive in that it increases the odds that offspring will survive because they are dependent upon a caregiver to meet their basic needs.[222] In most situations, children have the opportunity to form an attachment with a primary caregiver who forms her own reciprocal bond with the child.[223] Jeffry Simpson and Jay Belsky elaborate:

> Compared to other species, human infants are born in an underdeveloped and premature state. From the moment of birth, however, human infants are prepared to bond with their caregivers. In addition, several postpartum reactions of mothers seem to operate in synchrony with those of their newborns, facilitating the early formation of infant-caregiver bonds. Systems that operate in a synchronous, lock-and-key fashion between codependent individuals are often telltale signs of evolved adaptations.[224]

Indeed, the predisposition to forming attachment bonds[225] is so strong that these bonds form even where the quality of the care provided is poor or the caregiver abuses the child.[226]

THEORY, RESEARCH, AND CLINICAL APPLICATIONS 348, 348–49 (Jude Cassidy & Phillip R. Shaver eds., 2d ed. 2008).

221. Cassidy, *supra* note 220, at 4–5; Regina Sullivan & Elizabeth Norton Lasley, *Fear in Love: Attachment, Abuse, and the Developing Brain*, CEREBRUM, Sept. 2010, at 3 (referring to attachment circuitry facilitating attachment bonding as "hardwiring in the baby's brain").

222. Cassidy, *supra* note 220, at 4–5; Sullivan & Lasley *supra* note 221; *see* Hofer & Sullivan, *supra* note 215, at 603; Jeffry A. Simpson & Jay Belsky, *Attachment Theory Within a Modern Evolutionary Framework*, *in* HANDBOOK OF ATTACHMENT: THEORY, RESEARCH, AND CLINICAL APPLICATIONS 131, 131 (Jude Cassidy & Phillip R. Shaver eds., 2d ed. 2008).

223. Children can, and typically do, form multiple attachments. Cassidy, *supra* note 220, at 14. "Indeed, empirical observations have revealed that the majority of children become attached to more than one familiar person during their first year." *Id.* The most common attachment figures are mothers and fathers, and frequently also other close relatives such as grandparents and older siblings. *Id.* Researchers have also found empirical support for theoretical notions of an "attachment hierarchy," whereby the child exhibits a strong tendency to seek comfort and security from certain figures, when available, over others. *Id.* at 15.

224. Simpson & Belsky, *supra* note 222, at 136 (citations omitted).

225. Cassidy summarizes important semantic distinctions:

> Whereas "attachment behavior" is behavior that promotes proximity to the attachment figure, . . . an "attachment bond" refers to an affectional tie. . . .
>
> The attachment bond is a specific type of a larger class of bonds that [John] Bowlby and [Mary] Ainsworth referred to as "affectional bonds." Throughout the lifespan, individuals form a variety of important affectional bonds that are not attachments.

Cassidy, *supra* note 220, at 12. Cassidy further summarizes Mary Ainsworth's articulation of the characteristics of affectional bonds and attachment bonds. An affectional bond is a persistent emotional tie with a specific person that leads an individual to seek and maintain contact with that person and to experience distress at separation. *Id.* Attachment bonds are viewed as a subclass of affectional bonds, where the individual seeks comfort and security in the relationship with the other

Decades of attachment research have underscored many of the complexities inherent in children's relationships with their caregivers. Observations of children who have been deprived of relationships or consistent contact with nurturing adults, such as children living in institutional settings, reveal severe delays and disturbances in physical and psychological development.[227] Children who experience maltreatment in the United States are not typically placed in institutions, yet many of those under the legal jurisdiction of the child protection system are removed from their parents or other primary caregivers and placed in an alternative care environment, typically foster care.[228] Significant disruptions in children's relationships with their primary caregivers can present developmental challenges for children.[229] In the short-term, such

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person. *Id.* at 14–15. Finally, in the context of parent-child relations during a child's youth, it is the child who seeks comfort and security from the parent. *Id.*

226. *See generally* Robert Sapolsky, *Any Kind of Mother in a Storm*, 12 NATURE NEUROSCI. 1355 (2009); Sullivan, *supra* note 107; *see also* Sullivan & Lasley, *supra* note 221, at 2–4.

227. *See, e.g.*, Mary Dozier & Michael Rutter, *Challenges to the Development of Attachment Relationships Faced by Young Children in Foster and Adoptive Care*, *in* HANDBOOK OF ATTACHMENT: THEORY, RESEARCH, AND CLINICAL APPLICATIONS 698, 699–700 (Jude Cassidy & Phillip R. Shaver eds., 2d ed. 2008); Charles H. Zeanah et al., *Orphanages as a Developmental Context for Early Childhood*, *in* BLACKWELL HANDBOOK OF EARLY CHILDHOOD DEVELOPMENT 424, 428–42 (Kathleen McCartney & Deborah Phillips eds., 2006).

228. Of the cases of child victims and nonvictims that were opened for child protection services across the United States, 36% (or 153,000) of child victims and 13.7% (or 76,000) of nonvictims were removed from their homes. AFCARS Report, *supra* note 78, at 90, 98. In September 2010, 408,425 children were in foster care in the United States, with a mean length of time in foster care of over two years (25.3 months). U.S. DEP'T OF HEALTH & HUMAN SERVS., THE AFCARS REPORT, PRELIMINARY FY 2010 ESTIMATES AS OF JUNE 2011 1 (2011) [hereinafter AFCARS PRELIMINARY]. Approximately half of the children lived in foster homes with non-relatives, and 15% lived in institutions or group homes. *Id.*

229. *See, e.g.*, Dozier & Rutter, *supra* note 227, at 701–02; Tiffany Field, *Attachment and Separation in Young Children*, 47 ANN. REV. PSYCHOL. 541, 546 (1996); Philip A. Fisher & Megan Gunnar, *Early Life Stress as a Risk Factor for Disease in Adulthood*, *in* THE IMPACT OF EARLY LIFE TRAUMA ON HEALTH AND DISEASE: THE HIDDEN EPIDEMIC 133, 133–34 (Ruth A. Lanius et al. eds., 2010); Michael B. Hennessy et al., *Separation, Sickness, and Depression: A New Perspective on an Old Animal Model*, 18 CURRENT DIRECTIONS PSYCHOL. SCI. 227 (2009); Phillip R. Shaver & R. Chris Fraley, *Attachment, Loss, and Grief: Bowlby's Views and Current Controversies*, *in* HANDBOOK OF ATTACHMENT: THEORY, RESEARCH, AND CLINICAL APPLICATIONS 48, 49 (Jude Cassidy & Phillip R. Shaver eds., 2d ed. 2008). The potentially detrimental effects of substantial disruptions in parent-child relationships resulting from child protection system removal of children from parental custody must be distinguished from the briefer and more routine parent-child separations that many children in our country experience while their parents are at work. Research findings indicate that most children can adapt to separations from parents necessitated by parental employment if the substitute care is of high quality (that is, providing consistency and substantial interaction with caring, sensitive adults). Michael Rutter, *Implications of Attachment Theory and Research for Child Care Policies*, *in* HANDBOOK OF ATTACHMENT: THEORY, RESEARCH, AND CLINICAL APPLICATIONS 958, 967 (Jude Cassidy & Phillip R. Shaver eds., 2d ed. 2008). There remains debate regarding several issues, such as "whether many hours or changing patterns of group day care . . . in the first year of life carries significant risks." *Id.*; *see* U.S. DEP'T OF HEALTH & HUMAN SERVS., NICHD STUDY OF EARLY CHILD CARE AND YOUTH DEVELOPMENT: FINDINGS FOR CHILDREN UP TO 4 ½ YEARS 1–3 (2006); Sarah L. Friedman et al., *Effects of Child Care on Psychological Development: Issues and Future Directions for Research*, 94 PEDIATRICS 1069, 1069–70

disruptions can cause psychological and physiological distress and dysregulation.[230] While the long-term consequences are not fully understood, these separation experiences may increase a child's vulnerability to the development of mental health and health problems throughout their lives.[231] Thus, the anticipated benefits to children of out-

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(1994); Ellen S. Peisner-Feinberg, *Child Care and Its Impact on Young Children's Development*, *in* ENCYCLOPEDIA ON EARLY CHILDHOOD DEVELOPMENT 3–4 (2004).

230. Ross A. Thompson & Mary Fran Flood, *Toward A Child-Oriented Child Protection System*, *in* TOWARD A CHILD-CENTERED, NEIGHBORHOOD-BASED CHILD PROTECTION SYSTEM: A REPORT OF THE CONSORTIUM ON CHILDREN, FAMILIES, AND THE LAW 155, 169–70 (Gary B. Melton et al. eds., 2002) (discussing the distress and confusion children experience when child protection services separate them from parents and siblings). Research with animals has demonstrated the dramatic impact of the offspring's separation from its caregiver. Myron A. Hofer, *Psychobiological Roots of Early Attachment*, 15 CURRENT DIRECTIONS PSYCHOL. SCI. 84, 85–86 (2006). Hofer observes the important role the mother rat plays in regulating the offspring's physiological processes:

> [The] warmth provided by the mother normally maintained the pup's activity level and . . . her milk maintained her pup's heart rate. Maternal separation withdrew these regulatory influences that were hidden within the ordinary mother-infant interactions, resulting in slowed behavior and low heart rate. . . . After 24 hours of separation, the REM-sleep time of pups . . . was sharply decreased and slow-wave sleep was fragmented by frequent short awakenings.

Id. at 86. Hofer emphasizes that separation from the attachment figure is more than "an affective response to stress." *Id.* Rather, in infants, the relationship provides "numerous regulatory processes hidden within the mother-infant interaction." *Id.* Hofer continues:

> In thinking about the implication of these findings for human infants, one can suppose that these kinds of simple maternal regulators would be found early in a baby's postnatal period, but that soon more subtle and intricate interactions would become important. Reciprocity, imitation, attunement, and play are now being investigated for their roles in regulating baby's affective state and his or her developing capacity to self-regulate and later engage in complex social interactions outside the parental relationship.

Id.; *see* Myron A. Hofer, *Hidden Regulators in Attachment, Separation, and Loss*, 59 MONOGRAPHS SOC'Y FOR RES. CHILD DEV. 192, 194–96 (1994). Research with nonhuman infant primates reveals that separation from the mother leads to manifestations of psychological distress as well as increased stress reactivity. Jamie L. LaPrarie et al., *The Neuroendocrine Effects of Early Life Trauma*, *in* THE IMPACT OF EARLY LIFE TRAUMA ON HEALTH AND DISEASE: THE HIDDEN EPIDEMIC 157, 161 (Ruth A. Lanius et al. eds., 2010).

231. For example, in studies with rats, Rosenfeld and colleagues found the following:

> Maternal deprivation results in a pronounced increase in HPA responsiveness, indicating that this system is at least partially under maternal regulation. . . . [S]hort periods of maternal deprivation do not have a cumulative effect, and . . . there appears to be a critical length of deprivation . . . beyond which persistent changes [in neuroendocrine system reactivity] ensue.

Patricia Rosenfeld et al., *Effects of Repeated Maternal Separations on the Adrenocortical Response to Stress of Preweanling Rats*, 52 PHYSIOLOGY & BEHAV. 787, 789 (1992). Research with nonhuman primates has revealed less consistent findings on the long-term modifications of the neuroendocrine response. Seymour Levine, *Developmental Determinants of Sensitivity and Resistance to Stress*, 30 PSYCHONEUROENDOCRINOLOGY 939, 943–44 (2005). By contrast, long-term changes in immune system function in monkeys have been detected. Christopher L. Coe et al., *Immunological Consequences of Psychological Disturbance and Maternal Loss in Infancy*, *in* 5 ADVANCES IN INFANCY RESEARCH 97, 127–28 (Carolyn Rovee-Collier & Lewis P. Lipsitt eds., 1988). One team of researchers studying disrupted attachment relationships observed that despite the significance "of childhood trauma, such as abuse or neglect, for later life, information on the long-term outcomes of parent-child separation is

of-home placement by the child welfare system *must* be weighed against the potentially deleterious impact of separating children from their primary caregivers, despite the perceived or documented inadequacies of the child's caregivers. Furthermore, frequent changes in caregiving arrangements and the accompanying difficulties maintaining attachment bonds with adults are likely quite detrimental to children.[232] Therefore, the possibilities of repeated disruptions in the continuity and stability of children's relationships with adults must also be weighed against the anticipated benefits of removal.

Fortunately, recent studies reveal that in circumstances when removal from parents has been deemed necessary for the child's well-being, high-quality foster care and access to certain evidence-based interventions facilitate children's healthy adjustment.[233] That said, children placed in foster care or other out-of-home placements by the child protection system confront two sets of developmental challenges: (1) coping with the effects of the maltreatment that triggered state involvement in the family, and (2) dealing with the effects of the disruptions in their relationships with caregivers and others. It is difficult to disentangle the relative contributions of each of these challenges to the long-term problems observed in children and adults who experienced maltreatment in childhood.[234]

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limited." Anu-Katriina Pesonen et al., *Depressive Symptoms in Adults Separated from Their Parents as Children: A Natural Experiment During World War II*, 166 AM. J. EPIDEMIOLOGY 1126, 1126 (2007). They note that most research focuses on the consequences of divorce or death. *Id.* at 1127. The research team took advantage of a "natural experiment" allowing comparison of three groups of adults who had been children during World War II. *Id.* at 1131. The researchers compared the depressive symptomatology of Finnish adults who were separated from both parents during the war (that is, "evacuated unaccompanied by either parent") with subjects who remained with their mothers and either experienced no parental separation or were separated from their fathers because of fathers' wartime military service. *Id.* at 1128. Those subjects separated from both parents as children revealed significantly greater adult depressive symptomatology than did subjects in the other groups. *Id.* at 1128–31. The findings indicate that the disruption of the parent-child relationship that occurred in the lives of the separated subjects can lead to long-term neurobiological changes manifesting as depressive symptoms in adulthood. *Id.* at 1131.

232. Comm. on Early Childhood, Adoption, and Dependent Care, *Developmental Issues for Young Children in Foster Care*, 106 PEDIATRICS 1145, 1146–48 (2000); Brenda Jones Harden, *Safety and Stability for Foster Children: A Developmental Perspective*, 14 FUTURE CHILDREN: CHILDREN, FAMILIES, & FOSTER CARE 31, 31–36 (2004); David M. Rubin et al., *Placement Stability and Mental Health Costs for Children in Foster Care*, 113 PEDIATRICS 1336, 1336 (2004).

233. *See, e.g.*, Dozier & Rutter, *supra* note 227, at 702–06. Ross Thompson summarizes research on the effect of early attachment experiences on later development. Thompson, *supra* note 220, at 348. He emphasizes that the role of early attachment experiences in predicting children's later adjustment depends, in part, on the maintenance of those experiences over time. *Id.* at 352. Reviewing research on attachment security, he observes that "early security of attachment interacts with the quality of subsequent experience (particularly sensitive parental care and broader life stresses) in predicting developmental outcomes." *Id.*

234. *See, e.g.*, Dozier & Rutter, *supra* note 227, at 701–02. Levine articulates the difficulty as follows:

The quality of one's relationship with an attachment figure can impact many facets of development. Ideally, the attachment relationship is "secure," allowing the child to "rely on that caregiver as an available source of comfort and protection.... Infants with secure attachment relationships are confident in the sensitive and responsive availability of their caregivers, and consequently these infants are confident in their own interactions with the world."[235] Securely attached children feel reassured that they can explore their environment—knowing they can return to the "secure base" of proximity with the caregiver.[236] This allows children to take advantage of a rich range of learning opportunities and to develop a sense of personal mastery. "Insecure" attachments, by contrast, follow from less than "consistent availability of and comfort from their caregivers when the environment has proven threatening."[237] One type of insecure attachment, the "disorganized/disoriented" attachment, has been found to occur in a range of situations, including those where a child is frightened by the caregiver, as in the context of maltreatment, leading the child to display confusion in the relationship with the caregiver.[238]

Research reveals that attachment security has an impact on many aspects of development. Children who experience responsive care and "smooth dyadic emotion regulation" in their relationships with their caregivers are more likely to develop a strong sense of personal efficacy, to be more capable of self-regulation, and to have positive expectations

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> Early adverse events in humans fall into two major categories, disruption or deprivation and/or abuse. Disruption consists of prolonged periods of separation from the primary caregiver. This includes permanent loss of this relationship through death, removal of the child from the home or abandonment. Deprivation refers to the condition in which the child is reared with limited or no potential to form a relationship with an adult. A primary example of disruption is foster care. Orphanage rearing would be considered a model of deprivation. Once again it is impossible to rule out that within the context of foster care or orphanage rearing that these children are not exposed to multiple adverse events..... Many foster care children have multiple placements and the quality of the foster care parenting varies. Thus there are frequent disruptions of the parent-child relationship.... Exposure for prolonged period to multiple adverse events would be expected to influence the HPA axis in foster care and orphanage reared children.

Levine, *supra* note 231, at 944.

235. Nancy S. Weinfield et al., *Individual Differences in Infant-Caregiver Attachment*, *in* HANDBOOK OF ATTACHMENT: THEORY, RESEARCH, AND CLINICAL APPLICATIONS 78, 79 (Jude Cassidy & Phillip R. Shaver eds., 2d ed. 2008).

236. *Id.*

237. *Id.*

238. *See generally* Vicki Carlson et al., *Disorganized/Disoriented Attachment Relationships in Maltreated Infants*, 25 DEV. PSYCHOL. 525 (1989); Karlen Lyons-Ruth & Deborah Jacobvitz, *Attachment Disorganization: Genetic Factors, Parenting Contexts, and Developmental Transformation from Infancy to Adulthood*, *in* HANDBOOK OF ATTACHMENT: THEORY, RESEARCH, AND CLINICAL APPLICATIONS 666 (Jude Cassidy & Phillip R. Shaver eds., 2d ed. 2008); Mary Main & Judith Solomon, *Procedures for Identifying Infants as Disorganized/Disoriented During the Ainsworth Strange Situation*, *in* ATTACHMENT IN THE PRESCHOOL YEARS: THEORY, RESEARCH, AND INTERVENTION 121 (Mark T. Greenberg et al. eds., 1990).

regarding their relationships with others.[239] Caregivers' sensitivity and responsiveness to children's cues teaches children that they can influence their world: "They acquire the experience and confidence to function autonomously."[240] Research findings indicate that children with secure attachments are more comfortable and adept in a wide range of circumstances, and are better able to develop healthy and supportive relationships with teachers, friends, and many others throughout their lives.[241] Other studies reveal, for example, that securely attached children demonstrate "more advanced memory processes, a more sophisticated grasp of emotion, a more positive understanding of friendship and . . . greater conscience development than insecurely attached children."[242]

Although a history of insecure attachment does not, in and of itself, predict psychopathology and other adaptive difficulties, such histories have been associated with greater vulnerability to life stressors and the development of a range of difficulties in functioning.[243] In particular, children with disorganized/disoriented attachment may manifest approach behaviors that are mixed with avoidance behaviors in certain interactions with their caregivers.[244] Children with disorganized attachment responses may freeze, "unable to choose between seeking proximity or avoiding the parent," or engage in a range of behaviors thought to evidence "stress and anxiety which the child cannot resolve because the parent is at the same time the source of fright as well as the only potential haven for safety."[245] Research suggests that this attachment pattern is associated with greater risk for the development of behavioral problems and psychopathology.[246] In her article in this Symposium issue, Sullivan provides a window into the way in which the neurobiology of infants may respond to these competing desires.[247] Her research indicates

239. Weinfield et al., *supra* note 235, at 84.

240. FROM NEURONS TO NEIGHBORHOODS, *supra* note 151, at 236 (citation omitted).

241. *Id.* at 236–37 (citations omitted).

242. *Id.* at 236–37 (citations omitted).

243. Weinfield et al., *supra* note 235, at 90–92.

244. Carlson et al., *supra* note 238, at 529.

245. Marinus H. van Ijzendoorn et al., *Disorganized Attachment in Early Childhood: Meta-Analysis of Precursors, Concomitants, and Sequelae*, 11 DEV. & PSYCHOPATHOLOGY 225, 226 (1999).

246. *Id.* at 227.

247. Gordon A. Barr et al., *Transitions in Infant Learning Are Modulated by Dopamine in the Amygdala*, 12 NATURE NEUROSCI. 1364 (2009); *see* Stephanie Moriceau & Regina M. Sullivan, *Maternal Presence Serves as a Switch Between Learning Fear and Attraction in Infancy*, 9 NATURE NEUROSCI. 1004 (2006); Sullivan, *supra* note 107; *see also* Sullivan & Lasley, *supra* note 221. For further discussion of neurobiology of attachment, see Hofer & Sullivan, *supra* note 215, at 787; Stephanie Moriceau & Regina Sullivan, *Neurobiology of Infant Attachment*, 47 DEVELOPMENTAL PSYCHOBIOLOGY 230 (2005); Jessica E. Shackman et al., *Environmental Influences on Brain-Behavioral Development: Evidence from Child Abuse and Neglect*, *in* HANDBOOK OF DEVELOPMENTAL COGNITIVE NEUROSCIENCE 869 (Charles A. Nelson & Monica Luciana eds., 2d ed. 2008); Regina M. Sullivan, *Developing a Sense of Safety: The Neurobiology of Neonatal Attachment*, 1008 ANNALS N.Y. ACAD. SCI. 122 (2003).

that when the attachment figure—who normally should serve as a source of comfort and security in the face of adversity—is a source of pain, the infant's brain undergoes neurobiological adaptations to facilitate coping with these challenging circumstances.[248] In rats, these adaptations appear to have serious deleterious long-term consequences, such as the development of depressive-like symptoms expressed later in life.[249]

The absence of a secure attachment to a caregiver creates another disadvantage for children whose relationships with their caregivers are characterized by maltreatment. Secure attachment relationships contribute to children's resilience in the face of stressors and challenges, allowing children to overcome or rebound from stressful life events more easily than can children without such relationships.[250] This finding has been replicated repeatedly in a range of contexts. For example, a series of studies demonstrated that attachment security moderates neurobiological stress responses when the caregiver is present: Infants in secure attachment relationships show more evidence of "maternal buffering of the adrenocortical system" than do insecurely attached infants in such situations.[251] In examining the roles that sensitive caregivers play in children's neurobiological functioning, another study concluded that that "the absence of a responsive, supportive caregiver to serve [as] an external extension of the child's stress regulatory system" can lead to pervasive long-term and deleterious effects.[252] Research also reveals that, in the absence of parental caregivers, the type of sensitive and responsive caregiving that tends to support secure attachments can help regulate stress hormones when provided by *non*-parental caregivers.[253] In his article in this issue, Thompson reviews a series of studies testing

248. *See generally* Sullivan, *supra* note 107.

249. *See generally id.*

250. Weinfield et al., *supra* note 235, at 90–91.

251. Megan R. Gunnar & Karina M. Quevedo, *Early Care Experiences and HPA Axis Regulation in Children: A Mechanism for Later Trauma Vulnerability*, 167 PROGRESS BRAIN RES. 137 (2008); Megan R. Gunnar, *Quality of Early Care and Buffering of Neuroendocrine Stress Reactions: Potential Effects on the Developing Human Brain*, 27 PREVENTIVE MED. 208, 209 (1998); Megan R. Gunnar & Bonny Donzella, *Social Regulation of the Cortisol Levels in Early Human Development*, 27 PSYCHONEUROENDOCRINOLOGY 199 (2002); Melissa Nachmias et al., *Behavioral Inhibition and Stress Reactivity: The Moderating Role of Attachment Security*, 67 CHILD DEV. 508 (1996).

252. Philip A. Fisher et al., *Effects of Therapeutic Interventions for Foster Children on Behavioral Problems, Caregiver Attachment, and Stress Regulatory Neural Systems*, 1094 ANNALS N.Y. ACAD. SCI. 215, 219 (2006) (emphasis omitted). The authors observe that a number of circumstances may have led to the lack of such adequate caregiving: absence of sensitive caregiving in one's family of origin, placement with an insensitive caregiver in foster care, or experience of multiple moves of foster care placements. *See* Fisher et al., *The Early Intervention Foster Care Program: Permanent Placement Outcomes from a Randomized Trial*, 10 CHILD MALTREATMENT 61 (2005).

253. Dante Cicchetti et al., *Normalizing the Development of Cortisol Regulation in Maltreated Infants Through Preventive Interventions*, 23 DEV. & PSYCHOPATHOLOGY 789 (2011); Mary Dozier et al., *Effects of an Attachment-Based Intervention on the Cortisol Production of Infants and Toddlers in Foster Care*, 20 DEV. & PSYCHOPATHOLOGY 845 (2008); Gunnar & Vazquez, *supra* note 132, at 560.

interventions designed to promote children's adjustment to foster care which lead to a positive shift in children's cortisol levels.[254]

Alicia Lieberman and Lisa Amaya-Jackson touch on the question of whether the maltreated child's experience differs from that of a child who experiences traumatic stress from sources outside of the family.[255] They emphasize the importance of bringing a "dual lens" to our investigations of trauma *and* attachment to "identify the protective and aggravating processes that link these two major influences on the young child's developmental course."[256] Other researchers make a useful distinction between what they refer to as the stress-generality model, which proposes a similar HPA response across stressors, and the stress-specific model, which focuses on "understanding pathways between family risk factors and children's physiological reactivity to stressors."[257] These more nuanced perspectives deserve continued attention. To the extent that there are distinct factors operating in the neurobiological and psychological responses of children to maltreatment by primary caregivers, identification of these factors may facilitate the development of more effective interventions.

IV. SOME IMPLICATIONS OF DEVELOPMENTAL NEUROSCIENTIFIC FINDINGS FOR CHILD PROTECTION POLICY

A goal of state regulation of children's lives is the promotion of "healthy, well-rounded growth . . . into full maturity as citizens, with all that implies."[258] Child protection policy, among other areas of law, seeks to promote this goal. Yet American law struggles in determining how to respond when parents appear not to act in the best interests of their children. While it is generally agreed that circumstances exist in which parents and children must be separated for the children's protection, there is substantial disagreement as to which circumstances justify such drastic state action.[259] Based on empirical research—some of which was

254. *See generally* Thompson, *supra* note 124.

255. Alicia F. Lieberman & Lisa Amaya-Jackson, *Reciprocal Influences of Attachment and Trauma: Using a Dual Lens in the Assessment and Treatment of Infants, Toddlers, and Preschoolers*, *in* ENHANCING EARLY ATTACHMENTS: THEORY, RESEARCH, INTERVENTION & POLICY 100 (Lisa J. Berlin et al. eds., 2005).

256. *Id.* at 100–01.

257. Melissa Sturge-Apple et al., *Interparental Violence, Maternal Emotional Unavailability and Children's Cortisol Functioning in Family Contexts*, 48 DEV. PSYCHOL. 237, 238 (2012).

258. Prince v. Massachusetts, 321 U.S. 158, 168 (1943).

259. *See, e.g.*, *In re* Texas Dep't Fam. & Protective Servs., 255 S.W.3d 613, 613 (Tex. 2008) (a divided court concluding that the Department was not justified in summarily removing 468 children from the Yearning for Zion Ranch—a 1,700-acre complex where a large community associated with the Fundamentalist Church of Jesus Christ of Latter Day Saints lived—on the basis of a telephone tip and concerns about the community's culture of polygamy and of encouraging under-aged girls to marry and have children with older men); *see also* Weithorn, *Protecting Children from Domestic*

reviewed briefly in Part III—we know that the effects of child maltreatment can be quite damaging neurobiologically, psychologically, and in terms of long-term physical health.[260] We also know that children typically become attached to their primary caregivers, even if the quality of care is poor,[261] and that separations and disruptions in relationships between children and the caregivers to whom they are emotionally bonded carry their own risks to children's welfare.[262] Ideally, therefore, a government that seeks to promote the "healthy, well-rounded growth" of children should strive to prevent maltreatment by *and* separations from children's primary caregivers. Our modern child protection system, however, does little to prevent maltreatment. It frequently responds to substantiated maltreatment—or risk of impending maltreatment—with intrusive separations of children from their parents. In 2010, hundreds of thousands of children were removed from their homes under the auspices of the child protection system, joining hundreds of thousands of children already in foster care at the beginning of that year.[263] In approximately half of these cases, the states that removed the children from their homes hoped to reunite the children with their parents.[264] Would there have been a way to protect these children that might have avoided separation from caregivers? And, where separation is determined to be necessary to the child's welfare, what can be done for children, parents, and alternative caregivers during that separation to promote children's best interests?

The findings of developmental neuroscience reported in Part III strengthen preexisting concerns about the welfare of children who experience maltreatment at the hands of their caregivers. These findings give added force and urgency to arguments that our government should invest in preventing and ameliorating child maltreatment and its sequelae in order to most effectively achieve its parens patriae and police power goals:[265] protecting children's welfare and promoting their development into well-adjusted adults who contribute constructively to society. Furthermore, where policies reflect ostensibly competing legal values—such as respect for parental autonomy and protection of children from harm—scientific investigation may inform the question of whether there exist approaches or interventions that promote both sets of goals. To the extent that two sets of goals seem irreconcilable, scientific studies may

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Violence, *supra* note 32, for a discussion of disagreements and widely divergent policies regarding child protection system removal of children exposed to adult partner violence.

260. *See supra* notes 92–2257 and accompanying text.

261. *See supra* notes 225–226 and accompanying text.

262. *See supra* notes 228–232 and accompanying text.

263. *See supra* note 228.

264. AFCARS PRELIMINARY, *supra* note 228, at 2.

265. *See, e.g.*, *supra* notes 19–25 and accompanying text.

open the door to new understandings and solutions built on common ground.[266]

In his companion piece in this issue, Thompson emphasizes that developmental neuroscience is a relatively new field and cautions that "the most confident applications of developmental neuroscience to policy and practice are when the conclusions of neuroscience are consistent with those of behavioral research."[267] "[M]ultiple studies . . . build upon each other. Replications of findings permit us greater confidence, as do subsequent studies that vary methods or samples but obtain similar results. Yet each single study or methodological approach gives us but one piece of a puzzle . . . ."[268] Recent formulations in the area of public policy analysis relating to children and families present some useful models for integrating knowledge and examining interrelationships among biological, behavioral, and social factors.[269] For example, the "biodevelopmental" framework is a recent adaption of the "social-ecological" perspective and recognizes that "human development is shaped by a dynamic and continuous interaction between biology and experience."[270] Along similar lines, the specialty of

266. For example, elsewhere I discuss how the implementation of evidence-based practices of collaboration between child protection and domestic violence agencies and practitioners can, in certain circumstances, lead to the resolution of ostensibly intractable debates regarding the proper response to children's exposure to adult partner violence. *See* Weithorn, *Protecting Children from Domestic Violence*, *supra* note 32, at 149–52. For a report on a national initiative evaluating the impact of these practices in several jurisdictions, see GREENBOOK NAT'L EVALUATION TEAM, THE GREENBOOK INITIATIVE FINAL REPORT (2008).

267. Thompson, *supra* note 124, at 1448–49.

268. Lois A. Weithorn, *Professional Responsibility in the Dissemination of Psychological Research in Legal Contexts*, *in* REFORMING THE LAW: THE IMPACT OF CHILD DEVELOPMENT RESEARCH 253, 258 (Gary B. Melton ed., 1987).

269. FROM NEURONS TO NEIGHBORHOODS, *supra* note 151, at 23.

270. *Id.* Several decades ago, psychologist Urie Bronfenbrenner introduced his social ecological perspective on children's development, focusing on the myriad of influences that derive from multiple social systems in which the child is directly involved or indirectly influenced and from the interrelationships of those systems with one another. URIE BRONFENBRENNER, THE ECOLOGY OF HUMAN DEVELOPMENT: EXPERIMENTS BY NATURE AND DESIGN (1979). Thus, for example, children engage in face-to-face interaction in a variety of *microsystems*—such as home, school, playground, and day care—which affect the child. A *mesosystem* "comprises the interrelations among two or more settings in which the developing person actively participates," that is, "a system of microsystems," and an *exosystem* constitutes "one or more settings that do not involve the developing person as an active participant, but in which events occur that affect . . . what happens in the setting containing the developing person" *Id.* at 7–26. The *macrosystem* incorporates culture, government, and other social environmental influences, including predominant ideologies that have an impact on the ways in which constituent systems function. Bronfenbrenner pointed out that parenting is influenced by all of these levels. *Id.* Psychologist James Garbarino expounded upon and applied Bronfenbrenner's social-ecological approach, providing a perspective within which we can understand some of the risks as well as the opportunities that affect children's development in these various nested and interacting systems. *See generally* JAMES GARBARINO, CHILDREN AND FAMILIES IN THE SOCIAL ENVIRONMENT (2d ed. 1992). More recently, the Committee on Integrating the Science of Early Childhood Development adapted the social-ecological perspective to incorporate the biological level. FROM NEURONS TO NEIGHBORHOODS, *supra* note 151, at 23. This model was adapted further by Jack Shonkoff, in part through his work with the National Scientific Council on the Developing Child, referring to it as a

developmental psychopathology examines syntheses among the "multiple domains of development . . . including cognitive, socioemotional, linguistic, representational, genetic, and neurobiological processes," as well as the "dynamic relation between the individual and his/her internal and external contexts."[271] The most meaningful analyses derive from the integration of such multiple perspectives.

The policy proposals presented below do not follow solely from neuroscientific findings but rather from the cumulative body of relevant science. The neurobiological findings strengthen the authority of proposals to: (1) prevent maltreatment whenever possible, rather than waiting to interrupt it; (2) promote positive parent-child relationships *as early* in a child's life as possible; (3) avoid disruptions of parent-child bonds—ideally by providing services to troubled families while a child remains at home; (4) provide alternative care that is not only safe, but also provides stable and sensitive caregiving, where separation of parent and child is necessary to protect the child; and, when intervening, (5) do so with attention to the *interrelationships* among the various facets of the child's functioning and the multiple social-ecological systems in which she functions.

Of course, applications of science to public policy questions must be tempered with appropriate scrutiny of the research findings and interpreted in light of the methodological limitations of the studies and their relevance to the policy questions at issue. Even where scientific methodology is rigorous and scientists are measured and cautious in their interpretations of data, it is not uncommon for the press or policymakers to oversimplify and dramatize findings, potentially distorting the meaning or import of the work.[272] Complexities are easily lost. With particular relevance to the use of developmental neuroscience in policy contexts, Thompson warns that tendencies to perceive certain biological findings deterministically may lead to misunderstandings of neuroscientific research in the policy context.[273] These tendencies, while drawing needed attention to some of the neurobiological effects of particular exposures or experiences, may lead consumers of such research to view neuroscientific

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"biodevelopmental framework." *See, e.g.*, Jack P. Shonkoff, *Building a New Biodevelopmental Framework to Guide the Future of Early Childhood Policy*, 81 CHILD DEV. 357 (2010). This view, in turn, has influenced policy positions ultimately adopted by the American Academy of Pediatrics, which promote an "ecobiodevelopmental framework." *See, e.g.*, AAP, *Policy Statement*, *supra* note 120; Shonkoff et al., *supra* note 120, at e234.

271. Dante Cicchetti & Sheree L. Toth, *Child Maltreatment*, 1 ANN. REV. CLINICAL PSYCHOL. 409, 414–15 (2005).

272. Weithorn, *supra* note 268, at 263–67; *see* Ross Thompson & Charles A. Nelson, *Developmental Science and the Media: Early Brain Development*, 56 AM. PSYCHOL. 5, 5 (2001) (stating that media accounts of social science "can result in overgeneralizations and inappropriate applications of research findings").

273. Thompson, *supra* note 124, at 1460.

changes as immutable and to underestimate the plasticity that is also a hallmark of developmental processes.[274] As such, these tendencies provide an example of the potential for misinterpretation that we encounter more generally when complex scientific findings are imported to policy contexts. With these caveats in mind, I consider some of the policy directions that are consistent with the research on the effects of child maltreatment, including developmental neuroscientific studies.

Current research findings in developmental neuroscience, together with other bodies of empirical data, support several policy directions. I address four possible responses here: (1) given the heavy psychological, social, and economic costs of child maltreatment borne by individuals and society, increase governmental investment in understanding and responding effectively to child maltreatment; (2) invest in the development, testing, and implementation of effective *preventive* and *early intervention* programs, including intensive *home-based* interventions; (3) coordinate intersystem responses to child maltreatment, integrating child protection, physical health, mental health, education, juvenile justice, and other services necessary to respond to the variously problematic nature of affected children's and families' needs; and (4) where children's safety and well-being necessitates removal from the home, provide stable and high-quality alternative placements with substantial training and support to alternative caregivers, whether kin or non-family, to provide children with optimal opportunities to cope with separation and benefit from sensitive and responsive care.

A. Increasing Governmental Financial Commitment to the Problem and Consequences of Child Maltreatment

The research on the direct and indirect effects of child maltreatment for individuals and society at large indicates that—consistent with its parens patriae and police power goals of protecting children and promoting their welfare—the government must enlarge its investment in understanding, preventing and intervening in child maltreatment. While we have known for over a century that a child's caregiving environment has important implications for her well-being, recent research has clarified the understanding that the repercussions of seriously inadequate and destructive home environments are greater, longer lasting, and more pervasive than previously envisioned. We have learned that child maltreatment is associated with changes in brain chemistry and structures as well as with suffering, behavioral problems, adult psychopathology, and socially destructive behavior. These neurobiological changes foreshadow

274. *Id.* at 1461.

the child's greater risk of developing a broad range of health conditions, morbidity, and premature mortality.[275]

The neurobiological data make the true impact of child maltreatment more concrete, which may, in turn, draw policymakers' attention to this issue. Some researchers observe that policymakers tend to respond with resources more readily "for the prevention of negative physical rather than mental health consequences."[276] Findings related to the neurobiological effects of maltreatment and the positive influences behavioral interventions may have in altering both psychological and neurobiological processes "may ultimately increase the availability of resources that can be directed toward the prevention of child abuse and neglect and toward the extensive treatment needs of these vulnerable children."[277]

B. PRIORITIZING PREVENTION

Although the Child Abuse and Prevention Act contains the word "prevention" in its title, the commitment to prevention has, in practice, focused on the rather limited goal of preventing future maltreatment in those cases in which prior incidents of maltreatment have already occurred in a family[278] or where family circumstances have deteriorated to a point where a child, in the absence of state intervention, is at risk of maltreatment in the short term.[279] As discussed in Part II, this "reactive" approach delays state involvement with families until such time as coercive intervention in the family is constitutionally permissible. Not only do such delays set up an inevitable tension between the dual goals of respect for family privacy and the protection of children, but they also deprive children of the benefits of the best possible chances of positive development in a healthy family environment. Viewing child maltreatment as an urgent public health problem, scholars argue that our legal system has "woefully neglected prevention, the key to most successful public health campaigns."[280]

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275. *See* Felitti *supra* note 96.

276. Cicchetti et al., *supra* note 253, at 798.

277. *Id.*

278. Thompson & Flood, *supra* note 230, at 157 (noting that the child protection system's primary concern is abuse recidivism).

279. *Id.* at 156–57 (emphasizing the "crisis orientation" of the current child protection system). For a discussion of the way in which prevention has typically been incorporated into traditional child protection policy and practice, see generally Jane Waldfogel, *Prevention and the Child Protection System*, 19 FUTURE CHILDREN: PREVENTING CHILD MALTREATMENT 195 (2009).

280. Marsha Garrison, *Reforming Child Protection: A Public Health Perspective*, 12 VA. J. SOC. POL'Y & L. 590, 595 (2005) ("Perhaps most importantly, both federal law and local practice have relied on the wrong medical model: law and practice reflect an 'acute care' treatment paradigm that aims at rapid cure and exit, while all the evidence suggests that child maltreatment—for both the maltreating parent and the victimized child—is a chronic condition which requires ongoing treatment and services.").

Research conducted in the last several decades has taught us a lot about the factors that place children and families at risk for maltreatment.[281] While the relationship among factors associated with higher rates of child maltreatment are complex, some of the factors—such as parental substance abuse, low birth-weight of infants, poverty, single parenthood—can help us identify those families in which there is a greater likelihood that maltreatment might occur.[282] Infants are statistically most likely to be at risk of experiencing maltreatment.[283] This finding suggests that, ideally, preventive efforts should begin prior to the child's birth or as soon as a family at risk is identified. Preventive interventions can be targeted more broadly or narrowly depending upon the nature of the interventions and the goals—as well as the available resources.[284]

The prevention-oriented programs offered thus far have proven not to be the panaceas that many had hoped.[285] Yet, arguably, many of these programs have focused on only one facet or dimension of the perceived problems, while the factors that cause and perpetuate child maltreatment are multifaceted and inextricably intertwined.[286] Thus, for example, parent-training programs may be of limited value if other factors—such as domestic or community violence—persist and increase the likelihood

281. *See, e.g.*, Jocelyn Brown & Patricia Cohen, *A Longitudinal Analysis of Risk Factors for Child Maltreatment: Findings of a 17-Year Prospective Study of Officially Recorded and Self-Reported Child Abuse and Neglect*, 22 CHILD ABUSE & NEGLECT 1065 (1998); Sandra M. Stith et al., *Risk Factors in Child Maltreatment: A Meta-Analytic Review of the Literature*, 14 AGGRESSION & VIOLENT BEHAV. 13 (2009); *Child Maltreatment: Risk and Protective Factors*, CTRS. FOR DISEASE CONTROL & PREVENTION, http://www.cdc.gov/violencePrevention/childmaltreatment/riskprotectivefactors.html (last visited July 1, 2012); JILL GOLDMAN ET AL., A COORDINATED RESPONSE TO CHILD ABUSE AND NEGLECT: THE FOUNDATION OF PRACTICE 27–34 (2003).

282. *See, e.g.*, Fred Wulczyn, *Epidemiological Perspectives on Maltreatment Prevention*, *in* 19 FUTURE CHILDREN: PREVENTING CHILD MALTREATMENT 39, 46–58 (2009); *see also* Garrison, *supra* note 280, at 626–30.

283. *See supra* note 282.

284. In the field of public health, prevention programs are often classified according to the level of services. Primary prevention programs, or "universal" programs, are directed toward the general population; secondary prevention programs target groups within the population who are viewed as being at higher risk than the general population for the problem the program seeks to prevent; tertiary prevention focuses on preventing reoccurrences of the problem in that segment of the population already affected. DAVID THOMAS ET AL., EMERGING PRACTICES IN THE PREVENTION OF CHILD ABUSE AND NEGLECT 8 (2003); *see* Matthew W. Stagner & Jiffy Lansing, *Progress Toward a Prevention Perspective*, *in* 19 FUTURE CHILDREN: PREVENTING CHILD MALTREATMENT 19, 26 (2009) (delineating programs as "universal, selective, and indicated").

285. *See* Waldfogel, *supra* note 279, at 199 (noting that services offered by protective services often consist of little more than periodic visits by overburdened caseworkers or are of poor quality and insufficient quantity). For a discussion of the efficacy of a wide range of prevention programs examined in the context of child maltreatment, see generally Stagner & Lansing, *supra* note 284; THOMAS ET AL., *supra* note 284.

286. For a discussion of social-ecological perspectives, see *supra* notes 269–271 and accompanying text.

that a child will be maltreated.[287] In addition, many of the prevention programs that have been promulgated in recent decades, such as home visit programs, were not constructed with attention to some of the principles that newer research has indicated are important for effective prevention programs.[288] One scholar suggests that the most sensible and cost-effective way of preventing abuse and neglect is to incorporate these goals into broader based policy initiatives directed at improving a range of aspects of children's early life experiences.[289] Indeed, policy responses that seek to address children's needs in isolation, without consideration of the interrelationships among problems, risk failure.[290]

Scientific understanding regarding how to intervene effectively to prevent abuse and neglect is in its infancy, although promising models exist.[291] As recommended by the CDC analysis cited in the introduction

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287. Deborah Daro & Kenneth A. Dodge, *Creating Community Responsibility for Child Protection: Possibilities and Challenges*, *in* 19 FUTURE CHILDREN: PREVENTING CHILD MALTREATMENT 67, 68–71 (2009) (examining the efficacy of community child abuse prevention efforts); Garrison, *supra* note 280, at 617–18 (emphasizing the relationship between poverty and child maltreatment).

288. *See, e.g.*, Kimberly S. Howard & Jeanne Brooks-Gunn, *The Role of Home-Visiting Programs in Preventing Child Abuse and Neglect*, *in* 19 FUTURE CHILDREN: PREVENTING CHILD MALTREATMENT 119, 135–38 (2009) (discussing strengths, limitations, and efficacy of home visitation programs); Maury Nation et al., *What Works in Prevention: Principles of Effective Prevention Programs*, 58 AM. PSYCHOL. 449 (2003) (reviewing a decade of empirical research on the efficacy of prevention programs). Maury Nation and colleagues distilled nine principles of effective prevention programs in their analysis of the empirical prevention program evaluation literature published in the 1990s. *Id.* at 450. Those principles include: comprehensiveness (that is, the program is comprised of multiple components that address the range of critical domains, such as family, peer, community "that influence the development and perpetuation of the behaviors to be prevented"), theory driven (that is, the program has a strong theoretical basis and empirical support), and appropriately-timed (that is, the program is initiated early enough to influence the development of the target behaviors and considers the developmental needs of the participants). *Id.* at 451–54.

289. *See* Michael S. Wald, *Preventing Maltreatment or Promoting Positive Development—Where Should a Community Focus Its Resources? A Policy Perspective*, *in* PREVENTING CHILD MALTREATMENT: COMMUNITY APPROACHES 182 (Kenneth A. Dodge & Doriane Lambelet Coleman eds., 2009).

290. *See* Weithorn, *Envisioning Change*, *supra* note 4, at 1477–78 (arguing that policy responses must consider and coordinate the multiple needs children may have that traditionally have been handled by different service and intervention systems, such as child welfare, health care, mental health, juvenile justice, and education); *see also* Thompson & Flood, *supra* note 230, at 162–64.

291. *See, e.g.*, PREVENTING CHILD MALTREATMENT: COMMUNITY APPROACHES (Kenneth A. Dodge & Doriane Lambelet Coleman eds., 2009); PROMOTING FAMILY WELLNESS AND PREVENTING CHILD MALTREATMENT: FUNDAMENTALS FOR THINKING AND ACTION (Isaac Prilleltensky et al. eds., 2001); NAT'L RES. COUNCIL, PREVENTING MENTAL, EMOTIONAL, AND BEHAVIORAL DISORDERS AMONG YOUNG PEOPLE: PROGRESS AND POSSIBILITIES (2009); Sheree L. Toth et al., *From Research to Practice: Developmental Contributions to the Field of Prevention Science*, *in* 36 MINNESOTA SYMPOSIA ON CHILD PSYCHOLOGY: THE ORIGINS AND ORGANIZATION OF ADAPTATION AND MALADAPTATION 323 (Dante Cicchetti & Glenn I. Roisman eds., 2011). The CDC has a webpage devoted to evidence-based programs to prevent child maltreatment. *Child Maltreatment: Prevention Strategies*, CTRS. FOR DISEASE CONTROL & PREVENTION, http://www.cdc.gov/ViolencePrevention/childmaltreatment/prevention.html (last visited July 1, 2012). For a "review of reviews" on the efficacy of child maltreatment prevention programs prepared under the auspices of the World Health Organization, see Christopher Mikton & Alexander Butchart, *Child Maltreatment Prevention: A Systematic Review of Reviews*, 87 BULL. WORLD HEALTH ORG. 353 (2009).

of this Article,[292] however, the comparative financial costs of child maltreatment alone—notwithstanding the enormous human suffering—justify making this a public health priority and directing the same types of resources toward effective prevention and intervention that we direct toward other major public health problems such as stroke and type 2 diabetes. In addition, some analysts predict that an effective preventive agenda could lead to significant economic savings measured against the current outlays for traditional reactive responses.[293]

Intervention before children are in imminent harm has many advantages. First, from a legal standpoint these services do not typically require coercive intrusion in the family. Rather, these services can be voluntary. If they are supportive, offering parents and other community members assistance—such as visits by nurses and other trained professionals and mobilization of community support networks—cooperation between parents and sponsoring agencies may be forged. Of course, there will likely always be some families who will decline participation. But if the services offered are truly responsive to families' needs, integrated into existing positive community networks, and are culturally competent, rejection may be minimized.

Second, an initial response that focuses on building partnerships with parents and intervening positively brings our child protection policies in line with our default legal presumptions about the importance of the parent-child bond—a presumption that is, in general, consistent with the research reviewed above.[294] In a review of Bowlby's seminal work in the field of attachment research, Inge Bretherton asserts that:

> A good society . . . would be one which, as far as humanly possible, minimizes disruptive events, protects each child's experience of attachment from harm, and supports family coping. . . . Valuing of attachment relations . . . has public policy and moral implications for society, not just psychological implications for attachment dyads. This brings me back to one of Bowlby's earlier statements: "If a community values its children it must cherish their parents."[295]

The services provided by today's child protection system generally do not adequately invest in family preservation, despite the ostensive valuation of that goal. Fidelity to Bretherton's (and Bowlby's) view requires investment in the development and evaluation of a range of home-based and intensive intervention services that work to strengthen families and parent-child relationships.[296] Research on the role that a

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292. *See* Fang, *supra* note 1.

293. Stagner & Lansing, *supra* note 284, at 28–29.

294. *See supra* notes 222–232 and accompanying text.

295. Inge Bretherton, *The Origins of Attachment Theory: John Bowlby and Mary Ainsworth*, *in* A CENTURY OF DEVELOPMENTAL PSYCHOLOGY 431, 459 (Ross D. Parke et al. eds., 1994) (citation omitted).

296. Using the term "preventive family preservation," Thompson and Flood focus on the benefits to children of child protection services that "enable families to remain intact while remediating

strong, positive relationship with a caregiver plays in promoting children's resilience indicates that these services are a primary goal of preventative and early intervention.[297] Avoiding children's removal from parents, where feasible, is not only consistent with our nation's respect for family integrity, but it avoids disruptive separations that might further contribute to a child's difficulties.

Third, preventive interventions are likely to reach a much larger proportion of maltreated children than the number that is known to child protective services. Research tells us that only a small percentage of cases in which children are subjected to maltreatment actually come to the attention of legal authorities.[298] While the Department of Health and Human Services collects data from the states regarding the report, investigation, and substantiation of suspected abuse or neglect, studies conducted using alternate methods suggest that the actual numbers of cases exceed those reports by many multiples.[299] Indeed, one recent series of articles in *The Lancet*, focusing on industrialized nations and including the United States, suggested that reported cases may reflect only one-tenth of the actual cases.[300] Regardless of the precise number or proportion of cases of child maltreatment that fail to come to the attention of authorities, a preventive approach that does not focus solely on serving formally identified cases maximizes the opportunity to intervene positively in non-identified families.

Fourth, preventive approaches are the most responsive to the neurobiological findings that the timing and duration of child maltreatment have an impact on the extent to which a child's brain can recover from these adverse experiences. Intervening before maltreatment occurs maximizes the opportunities for healthy brain development. Certainly such a strategy is preferable to one that reacts only after circumstances are sufficiently dangerous to the child to necessitate coercive government intervention in the family. At the same time, where prevention is not possible, early intervention offers greater benefits to children than does delay until circumstances deteriorate further.

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problems of inadequate care or supervision, discipline, or other needs . . . . before their problems have reached the crisis when child removal from the home is necessary." Thompson & Flood, *supra* note 230, at 177–78. "[T]he concept of preventive family preservation . . . emphasizes the provision of material resources and social support to enable high-risk families to function more effectively before abuse has occurred, and to allow families where maltreatment has occurred to keep their children at home." *Id.* at 179–80.

297. Dozier & Rutter, *supra* note 227, at 704; Danya Glaser, *Child Abuse and Neglect and the Brain—A Review*, 41 J. CHILD PSYCHOL. PSYCHIATRY 97, 111 (2000); Lieberman & Amaya-Jackson, *supra* note 255, at 115. For examples of intervention programs that target enhancement of early attachments, see generally LISA J. BERLIN ET AL., ENHANCING EARLY ATTACHMENTS: THEORY, RESEARCH, INTERVENTION, AND POLICY (2005).

298. *See supra* note 78 and accompanying text.

299. *See supra* note 78 and accompanying text.

300. *See supra* note 78.

Investigators have heralded the research on the neurobiological effects of maltreatment as signaling optimism regarding the possibilities for successful intervention to reverse or ameliorate the damaging effects of child maltreatment on the brain and psychological, and social functioning.[301] But the longer one waits to intervene, the more difficult and expensive these efforts are, and the benefits of success are perhaps somewhat more limited.[302]

C. Applying an Ecological-Biodevelopmental Framework That Promotes Intersystem Coordination

The fragmented and piecemeal provision of services to children and families under the auspices of the current child protection system rarely addresses the complex and myriad needs of the children and families coming within its jurisdiction. Furthermore, interventions are frequently not targeted to the actual problems confronting the family. Our child protection system must dramatically increase the availability of a wider range of evidence-based services to assist multi-problem families in dealing with the broad array of challenges characterizing their circumstances. Elsewhere, I have emphasized the importance of using the social-ecological framework in constructing intervention approaches to problem families.[303] The findings reported in this Article strongly support the expansion of that framework to incorporate biological and developmental themes, as illustrated by the "ecobiodevelopmental" approach described by a committee of the American Academy of Pediatrics.[304] In an earlier article, I identified some of the characteristics shared among promising intervention approaches targeting multi-problem families:

> (1) a view of the child within her natural social environment; (2) a broad view of healthy psychological functioning as relating to many important spheres (including family, school, and peers); (3) a strategy of intervention that includes or emphasizes family functioning; (4) a focus on the development of strengths and capacities; (5) an individualization of the particular services selected for each child and

301. *See, e.g.*, De Bellis & Thomas, *supra* note 165, at 114.

302. Thompson, *supra* note 124, at 1464–65 ("First, because neuroplasticity is greatest early in life and declines gradually with increasing age, the early years offer the most promising opportunities for effective intervention. For example, the neural networks underlying behavioral dispositions, . . . stress responding, and other psychological processes . . . become more consolidated [as children mature]. Second, with age it thus becomes biologically and economically more costly to improve developmental outcomes for children in difficulty. Although well-designed intervention efforts have the potential of being effective with sufficient time and intensity, they are likely to require greater time, effort, and expense when impacting neural networks and behavior that have become well-established over time.").

303. Weithorn, *Envisioning Change*, *supra* note 4, at 1489–90.

304. *See supra* note 270 and accompanying text.

> family; and (6) an organized conceptual framework coordinating various levels and types of interventions.[305]

I have also argued that services to children must coordinate intersystem responses.[306] Children and families who come within the purview of the child protection system often come to the attention of other service and intervention systems, such as the health, mental health, education, or juvenile justice systems.[307] The summary of short- and long-term effects of child maltreatment presented above clearly demonstrates that individuals and families touched by child maltreatment are likely to be involved in multiple intervention and care systems.[308] Failure to coordinate the legal policy responses to these families leads to an ineffective and cost-inefficient provision of services:

> [T]he compartmentalization of children's and families' behavior and needs into the artificial and rigid conceptual categories reflected by multiple service and intervention systems ignores the overlap in the populations served by these systems, and the multifaceted nature of these children's and families' problems and needs. Working in isolation, the several service and intervention systems inadequately serve children's and families' needs, operating quite inefficiently.[309]

Children in child welfare system have high levels of unmet need for health, mental health, and special education services.[310] Many professionals and scholars have called for the implementation of comprehensive assessments of the needs of these children so that appropriate service plans can be developed.[311] In order to adequately meet the needs of these children and their families, mechanisms must be developed to integrate and coordinate the range of services that now exist in a disconnected array of service and intervention systems.[312]

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305. Weithorn, *Envisioning Change*, *supra* note 4, at 1493.

306. *Id.* at 1477–78.

307. *Id.*; *see also* Lois A. Weithorn, Note, *Mental Hospitalization of Troublesome Youth: An Analysis of Skyrocketing Admission Rates*, 40 STAN. L. REV. 773, 804–05 (1988).

308. *See supra* notes 92–105 and accompanying text.

309. Weithorn, *Envisioning Change*, *supra* note 4, at 1474.

310. *See, e.g.*, CHILD WELFARE LEAGUE OF AMERICA, CWLA STANDARDS OF EXCELLENCE FOR HEALTH CARE SERVICES FOR CHILDREN IN OUT-OF-HOME CARE (2007); Comm. on Early Childhood, Adoption & Dependent Care, Am. Acad. of Pediatrics, *Developmental Issues for Young Children in Foster Care*, 106 PEDIATRICS 1145 (2000); Comm. on Early Childhood, Adoption & Dependent Care, Am. Acad. of Pediatrics, *Health Care of Young Children in Foster Care*, 109 PEDIATRICS 536 (2002); Laurel K. Leslie et al., *Addressing the Developmental and Mental Health Needs of Young Children in Foster Care*, 26 J. DEV. BEHAV. PEDIATRICS 140 (2005); Am. Acad. of Child and Adolescent Psychiatry, *Psychiatric Care of Children in the Foster Care System* (Sept. 20, 2001), http://www.aacap.org/cs/root/policy_statements/psychiatric_care_of_children_in_the_foster_care_system.

311. *See supra* note 310.

312. *See, e.g.*, Thompson & Flood, *supra* note 230, at 184–89.

D. Ensuring That Alternative Placements Meet Maltreated Children's Special Needs

Where children's safety and well-being necessitates removal from home, the system must insure the *stability* of placements, particularly in light of the observation that placements are sometimes brief and that children may move frequently from placement to placement.[313] In addition, alternative caregivers, whether those caregivers are kin or non-family, need *training and supportive services* to assist them in meeting these children's special needs. Maltreated children removed from their homes are dually challenged by their history of maltreatment and separation from their familiar caregiving environment. These factors place them at risk for the development of a range of difficulties. Sensitive and responsive caregiving can help them in coping with their experiences and may help remediate existing problems. Studies have shown that various characteristics of alternate caregivers—which might guide selection—and certain evidence-based intervention programs may improve the functioning of children in foster care and adoption following child protection system intervention.[314]

In recent years, "kinship foster care" has been recognized by the child protection system as a viable alternative to foster care.[315] When parents are unable or unwilling to provide safe and adequate home environments for their children and children are adjudicated as dependent, kinship foster care turns to the natural resources inherent in the extended families of children.[316] Intuitively, the concept of keeping children's care within their larger family network is appealing, especially where children have preexisting bonds, perhaps even attachment bonds, with the alternative caregiver. As an informal practice, over two million children live with extended family members without a primary parent present in the home.[317] Kinship foster care—both formal and informal—has been

313. Mary Elizabeth Putnick, *The State as Parent: Using Attachment Theory to Develop Child Welfare Policy in the Best Interests of the Child*, 24 N.Y.U. Rev. L. & Soc. Change 419, 431–36 (1998); Rubin et al., *supra* note 84.

314. For a summary of research findings, see Dozier & Rutter, *supra* note 227; see also *infra* notes 322–324 and accompanying text.

315. *See, e.g.*, U.S. Dep't of Health & Human Servs., Report to the Congress on Kinship Foster Care 7–8 (2000) [hereinafter Report to Congress on Kinship Foster Care]; Rob Geen, *Kinship Foster Care: An Ongoing, Yet Largely Uninformed Debate*, *in* Kinship Care: Making the Most of a Valuable Resource 1, 1 (Rob Geen ed., 2003).

316. Report to Congress on Kinship Foster Care, *supra* note 315 at 5–6; Geen, *supra* note 315, at 2–3.

317. Federal Interagency Forum on Child and Family Statistics, America's Children: Key National Indicators of Well-Being 2011 3 (2011) ("Among the 3.0 million children . . . not living with either parent in 2010, 54 percent (1.7 million) lived with grandparents, 21 percent lived with other relatives only, and 24 percent lived with nonrelatives.").

inadequately studied.[318] Kin placements are often challenged by problems such as poverty and the multiple demands on caregivers, some of whom are aging (for example, grandparents) and in poor health.[319] Inadequate financial support to kinship-foster caregivers because of an unwieldy network of federal and state policies undercuts many kinship placements.[320] Yet, the intuitive benefits of exploring such options seem clear, particularly if careful selection, adequate training, support services, and financial assistance are provided.

Depending on the needs of particular children, the child protection system should provide a continuum of service to those in out-of-home placements, beginning with screening and identification of those children and families who need supplemental services.[321] Such services can offer adjuncts to foster care, either providing enrichment for children or targeting specific needs through professional services. Several evidence-based interventions to assist children in foster care have demonstrated initial success and offer much promise.[322] For example, programs such as Keeping Foster and Kin Parents Skilled and Supported provide training and support for foster parents in groups, assisting them in addressing specific behavioral problems.[323] Intensive therapeutic foster care intervention, such as Multidimensional Treatment Foster Care, provides a continuum of services to meet the needs of children with serious behavioral or emotional problems.[324] Interventions of these types are, of

318. *See* Gary S. Cuddeback, *Kinship Family Foster Care: A Methodological and Substantive Synthesis of Research*, 26 CHILDREN & YOUTH SERVS. REV. 623, 624 (2004); Laurel K. Leslie et al., *The Heterogeneity of Children and Their Experiences in Kinship Care*, 79 CHILD WELFARE 315, 317 (2000).

319. REPORT TO CONGRESS ON KINSHIP FOSTER CARE, *supra* note 315, at 33–40; Geen, *supra* note 315, at 6–8.

320. Meredith L. Alexander, Note, *Harming Vulnerable Children: The Injustice of California's Kinship Foster Care Policy*, 7 HASTINGS RACE & POVERTY L.J. 381 (2010); Jennifer Ehrle & Rob Geen, *Children Cared for by Relatives: What Services Do They Need?*, NEW FEDERALISM: NATIONAL SURVEY OF AMERICAN FAMILIES (No. B-47) 1 (2002).

321. *See, e.g.*, Philip A. Fisher et al., *Improving the Lives of Foster Children Through Evidenced-Based Interventions*, 4 VULNERABLE CHILDREN & YOUTH STUDIES 122 (2009).

322. Philip A. Fisher et al., *The Early Intervention Foster Care Program: Permanent Placement Outcomes from a Randomized Trial*, 10 CHILD MALTREATMENT 61 (2005); Philip A. Fisher & Patricia Chamberlain, *Multidimensional Treatment Foster Care: A Program for Intensive Parent Training, Family Support, and Skill Building*, 8 J. EMOTIONAL & BEHAV. DISORDERS 155, 155–164 (2000).

323. Patricia Chamberlain et al., *Prevention of Behavior Problems for Children in Foster Care: Outcomes and Mediation Effects*, 9 PREVENTION SCI. 17 (2008).

324. Multidimensional Treatment Foster Care incorporates intensive training and ongoing support to foster care providers while delivering individualized therapeutic services to the children. In order to promote consistency across the children's environments, the program provides consultation to the children's schools and other community settings in which the children are involved. Fisher & Chamberlain, *supra* note 321, at 155–56. The authors report positive outcomes in their empirical evaluations of the program's efficacy with respect to "the likelihood of achieving [placement] permanency (this effect is particularly marked for children who have had multiple prior foster placement failures), children's attachment to caregivers, foster-parent stress levels, older children's delinquency and antisocial behavior, participation in school, and subsequent time incarcerated." *Id.*

course, entirely feasible for use with relative foster parents as well as non-relative foster parents.

CONCLUSION: "THE NEUROBIOLOGY OF HOPE"[325]

The findings of developmental neuroscience regarding the impact of child maltreatment on the brain provide added force to criticisms of our society's predominant child protection system response to the problem of child maltreatment. This response is reactive, rather than proactive, and adversarial rather than supportive and collaborative. In light of the sometimes devastating effects of child maltreatment on the brain, and therefore also on behavior, physical health, and the ability to function adequately in society, prevention of child maltreatment offers children at risk the best hope of normality and of a satisfying and socially-constructive life. The voices of neuroscientists now join those of behavioral psychologists, pediatricians, epidemiologists, and others whose efforts argue for prioritizing preventive approaches to child maltreatment and associated adverse childhood experiences. Characterizing child maltreatment as a public health problem of major proportions, the Centers for Disease Control and others advocate strong public and private efforts to protect children from experiencing victimization at the hands of the adults to whose care they are entrusted.At the same time, efforts to help those children who have already experienced abuse or neglect must be intensified. Recent findings by developmental neuroscientists reveal that there is room for optimism about the success of treatment interventions, even after child maltreatment or its initial deleterious effects are identified. De Bellis and Thomas refer to "the neurobiology of hope," pointing to evidence of the reversibility or amelioration of some of the abnormalities observed:[326]

> It may be possible to repair or regrow damaged and lost neurons. . . . Early psychosocial and treatment interventions may theoretically prevent and improve adverse effects. Support in times of stress may partially normalize biologic stress systems' responses. . . .
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> . . . .

The authors have also concluded from their investigations that the "underlying neurobiological systems known to be affected by the types of early stress experienced by foster children" can be positively affected by these interventions. *Id.* They report, for example, that "one study found that cortisol levels of children who received the intervention normalized over time" while foster children not participating in the program "showed greater dysregulation in cortisol over time." *Id.* The study found that participation in the intervention led to reductions in the stress levels reported by foster parents, which was associated with greater regulation of the children's cortisol levels. *See* Leslie D. Leve et al., *Multidimensional Treatment Foster Care as a Preventive Intervention to Promote Resiliency Among Youth in the Child Welfare System*, 77 J. PERSONALITY 1869 (2009).

325. De Bellis & Thomas, *supra* note 165, at 114.

326. *Id.*

> ... [T]herapeutic reversibility of the adverse brain developmental effects of maltreatment [may be possible, offering] hope for improved function in children who suffer the sequelae of child abuse and neglect.... [T]he biologic effects of PTSD and child maltreatment are some of the few preventable contributors to child psychopathology, cognitive impairment, and developmental disorder.[327]

At the beginning of this Article, I observed that the heavy toll exacted by child maltreatment extends far beyond the individuals who are the direct victims of maltreatment. It is borne by the entire society, "reverberating across relationships, generations, and communities." If policymakers make the right investments, the combined wisdom gleaned from the efforts of multiple scientific disciplines can pave the pathways to the development of effective preventive and intervention strategies that decrease the risks faced by children and promote children's resilience in coping with those risks that remain.[328]

327. *Id.*

328. *See, e.g.*, Mark T. Greenberg, *Promoting Resilience in Children and Youth: Preventive Interventions and Their Interface with Neuroscience*, 1094 ANNALS N.Y. ACAD. SCI. 139 (2006); Ann S. Masten, *Resilience in Children Threatened by Extreme Adversity: Frameworks for Research, Practice, and Translational Synergy*, 23 DEV. & PSYCHOPATHOLOGY 493 (2011).